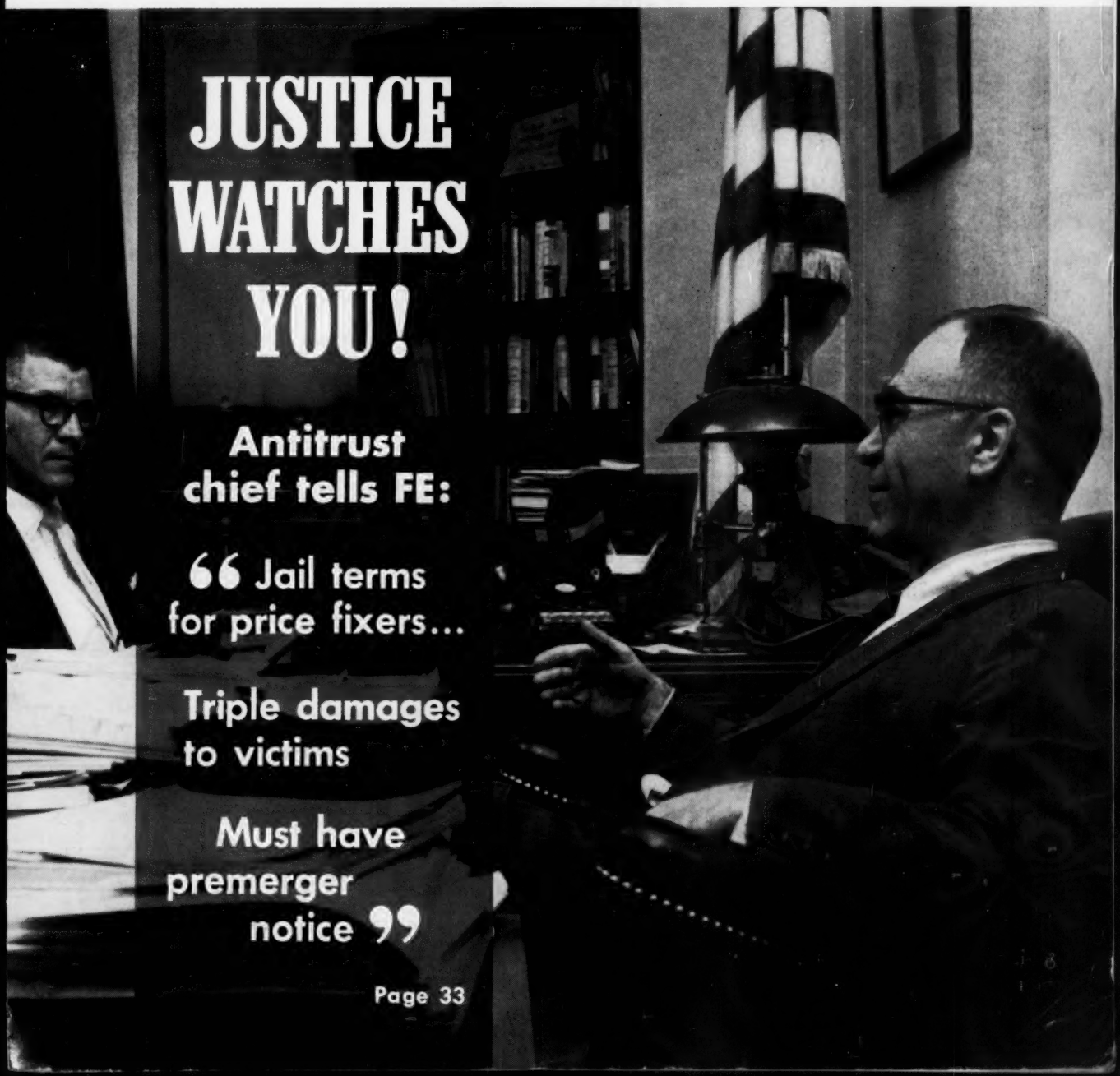
JULY 1961

FOOD ENGINEERING

A CHILTON PUBLICATION

FOR BETTER MANAGEMENT IN MANUFACTURING



JUSTICE WATCHES YOU!

Antitrust chief tells FE:

"Jail terms for price fixers...

Triple damages to victims

Must have premerger notice"

Page 33

The 4th "INGREDIENT"

BUILDS SALES... yet never costs a penny!

Food manufacturers satisfied with only the finest quality ingredients have for decades been using STERWIN (1) color, (2) enrichment and (3) vanillin. The result has been ice cream, baked goods, candy, beverages (and many other food products) that look better, taste better . . . *sell better!*

STERWIN's 4th "ingredient" has played a major role, too, in much of this sales success . . . and never cost a penny! For this "ingredient" is STERWIN Service . . . practical suggestions and recommendations by STERWIN's Technically Trained Representatives that frequently cut production costs while helping turn out better selling food products.

These STERWIN Representatives are highly trained, broadly experienced men who constitute a nationwide, on-the-spot task force for the more efficient production of food products. Small, medium and large food manufacturers have saved time, money, labor as a result of the sound advice and counsel offered by these sales-minded technicians.

If you use color, vanillin, enrichment . . . see your STERWIN Representative or write us direct. Learn how the 4 STERWIN ingredients can help your products look better, taste better . . . *SELL better.*

Sterwin Chemicals INC.

Subsidiary of Sterling Drug Inc.

1450 Broadway, New York 18, N.Y.

CIRCLE 2 ON INQUIRY CARD

FOOD
ENGINEERING
A CHILTON PUBLICATION
FOR BETTER MANAGEMENT
IN MANUFACTURING

VOL. 33 NO. 7

July, 1961

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SPECIAL FE REPORT

Here's how industry leaders are reshaping their distribution programs for improved efficiency, lower costs, better customer service and on-target production scheduling.—p. 59.

Photo courtesy of The Frito Company

Another customer admires Koroseal's lack of taste

THESE corn chips are on their way from deep fat fryers to packaging machines. At one time belts made of canvas were used for jobs like this. But cooking oil clinging to the chips soaked into the canvas, stained it, sometimes made it rancid. Keeping these belts clean was next to impossible.

Then B.F.Goodrich developed an entirely new kind of conveyor belt made of Koroseal vinyl. This belt stands oil, grease, salt, heat, and just about everything else that ruins ordinary belts. What's more, Koroseal belts have no taste, no odor, and no harmful ingredients to transfer to food. They resist cracking and peeling, never get soft and sticky. And since oil can't soak into Koroseal's smooth, polished surface, this B.F.Goodrich belt is as easy to wash clean as your dishes at home.

The Koroseal belt is typical of the many products developed by B.F.Goodrich for fast clean handling of food products. If you would like to know more about the different conveyor belts, or special kinds of hose for handling syrup, molasses, flour, or rigid vinyl pipe that acids can't ruin, talk to your BFG distributor. As a factory-trained specialist in rubber products, he can answer your questions about any of the products B.F.Goodrich makes for food processing plants. *B.F.Goodrich Industrial Products Co., Dept. M-107, Akron 18, Ohio.*

Koroseal—T.M.Reg. U.S. Pat. Off.

B.F.Goodrich

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ELECTRIC INFRARED PROCESSING EQUIPMENT NOW PROVIDES TEMPERATURES FROM 1° TO 3000° F. FOR ANY INDUSTRIAL APPLICATION WHERE HEAT IS REQUIRED

The Fostoria Infrared process is partly responsible for the quality built into the products you see here. Its versatility provides economies unheard of in convection heating equipment. Its speed breaks bottlenecks in production techniques. Its flexibility allows adjustment to new conditions with a minimum of effort. If you use heat in your manufacturing process, make a note to check with Fostoria about how to improve product quality with this time-saving, money-saving, labor-saving electric infrared equipment.

For temperature requirements under 900° F. send for folder "Applications Unlimited."

For temperature requirements from 900° to 3000° F. send for "Breakthrough" folder.

BREAK THROUGH!

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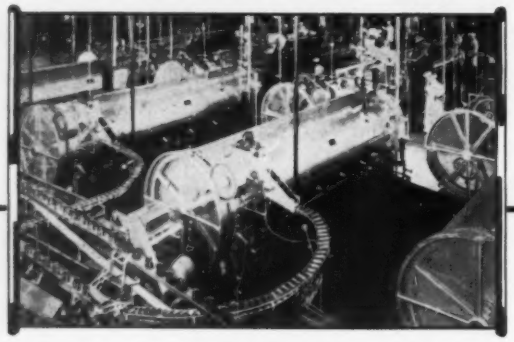
MANUFACTURERS OF ENGINEERED RADIANT ENERGY EQUIPMENT AND CRITICAL WORK AREA LIGHTING

OVER 500,000 CANS PER DAY *

SCIENTIFICALLY AND AUTOMATICALLY PROCESSED TO PERFECTION... ...ARE YOURS?



* A single FMC "Sterilmatic"* Continuous Pressure Cooker and Cooler Line, for example, handles 360 No. 303 cans of brine corn per minute – sterilizing and cooking by the "in-can" method with safety and uniformity. Cans are transferred automatically to the pressure cooling shell and discharged onto the take-away conveyor at the rate of more than 500,000 cans per 24-hour peak season day.

Processors who have replaced old-fashioned batch retorts with FMC "Sterilmatic" Continuous Pressure Cooker and Cooler Lines, have practically eliminated the costly dangers of spoilage or contamination caused by incorrect retort operation, faulty equipment, improper piping, improper venting and timing procedures. With FMC "Sterilmatic," processors are virtually assured of a perfectly processed pack – every time.

WHY FMC "STERILMATIC" COULD BRIGHTEN YOUR PROFIT PICTURE

CONSTANT QUALITY – The controlled agitation process assures that products will be cooked and cooled with absolute uniformity to pre-determined quality standards.

COMPLETE STERILIZATION – "In-can" cooking method means that contents and containers are sterilized simultaneously – at temperatures up to 275° F. The high-temperature, short-time processing of FMC "Sterilmatic" Lines preserves the natural color, flavor, texture and nutrients of the product.

POSITIVE CAN HANDLING – Cans are positively controlled throughout. Can denting, a common problem in retort operations, is practically eliminated.

FASTER PROCESSING – Induced convection heating through agitation increases the rate of heat penetration, resulting in substantial reductions of over-all processing time. Conversely, the same principle applies in the cooling process.

LOWER OPERATING COSTS – The "One-Man Cook Room" is a reality with FMC "Sterilmatic" Lines. The absence of repeated venting procedures saves up to 50% in steam. Controlled counterflow cooling of cans keeps water consumption to a minimum.

For more than 35 years, FMC "Sterilmatic" Continuous Pressure Cooker and Cooler Lines have been serving the food processing industry, providing faster, safer processing and money-saving benefits for satisfied users. FMC is ready to give you – without obligation on your part – proven facts, figures and plans that could lead you to greater profit possibilities. Why not contact us today?

Dedicated to serving the food industries through better equipment for better food products

*Trade Mark—Reg. U.S. Pat. Off.

Putting Ideas to Work

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TRENDS & FORECASTS

Rising economy could spark 8.4% pickup in food manufacturing profits and 5.2% increase in volume in 2nd half of '61. So say executives polled by FE, who report 3.3% drop in profits with 3.6% sales gain in 1st half.

Net income of 41 leading food and beverage manufacturers was 16% lower in 1st quarter of '61 than in 4th quarter of '60, or **$66.2** million. Drop is only 1% against 1st quarter of '60.

Physical output of processed foods gained 10% from '57 to '60.

Prepared food sales hit $3.7 billion in '60, up 23.4%. Estimate for '65 is $4.6 billion; for '70, $5.2 billion. Data are from Colgate-Palmolive, which is looking into the business.

Per capita food consumption in '60 was 1,488 lb., USDA reports. It has not changed significantly since records have been kept.

Of this, 414 lb. is dairy products; 409 lb. fruits and vegetables; 178 lb. meat; 146 lb. flour and cereal products; 108 lb. potatoes; 108 lb. sugar and syrup; 67 lb. fats and oils; 48 lb. frozen foods; 41 lb. **eggs**; 17 lb. coffee, tea and cocoa.

Average family income before taxes in '60 was $6,900, up $300 over '59. More than 45% of families had incomes over $6,000.

Frozen vegetable pack gained 20.6% to 1,958.6 million lb. in '60. Potato products were up 48.5%; broccoli 24%.

Frozen fruit, berry pack rose 13% to 697 million lb. RSP cherries were up 35%.

Shipments of cans for soft drinks increased 81.8% in 1st quarter of '61; for beer, 5.1%; lard and shortening, 23.4%; vegetable juices, 22.6%; coffee, 12.5%; evaporated and condensed milk, 5.2%; fish and seafood, 3.3%. Data are from Can Mfrs. Institute.

Manufacturers' sales of confectionery and chocolate products increased 5% in '60 to $1.2 billion, Bureau of Census finds.

Wheat flour production in '60 was 1.8% higher, or 255.1 million cwt. Production was at 92.4% of capacity.

Consumption of corn cereals rose 58% **in decade '47-'58** to 308 million lb. for ½-lb.-per-capita gain. Wheat cereals dropped 0.8 lb. per capita.

See Developments to Watch p. 15

Maple syrup production in '61 is estimated at 1.5 million gal., up 34% over '60. Further gains will come from central processing.

Take a look at the pump that was designed

TRI-CLOVER PR

LUBRICATION—GEARS—BEARINGS

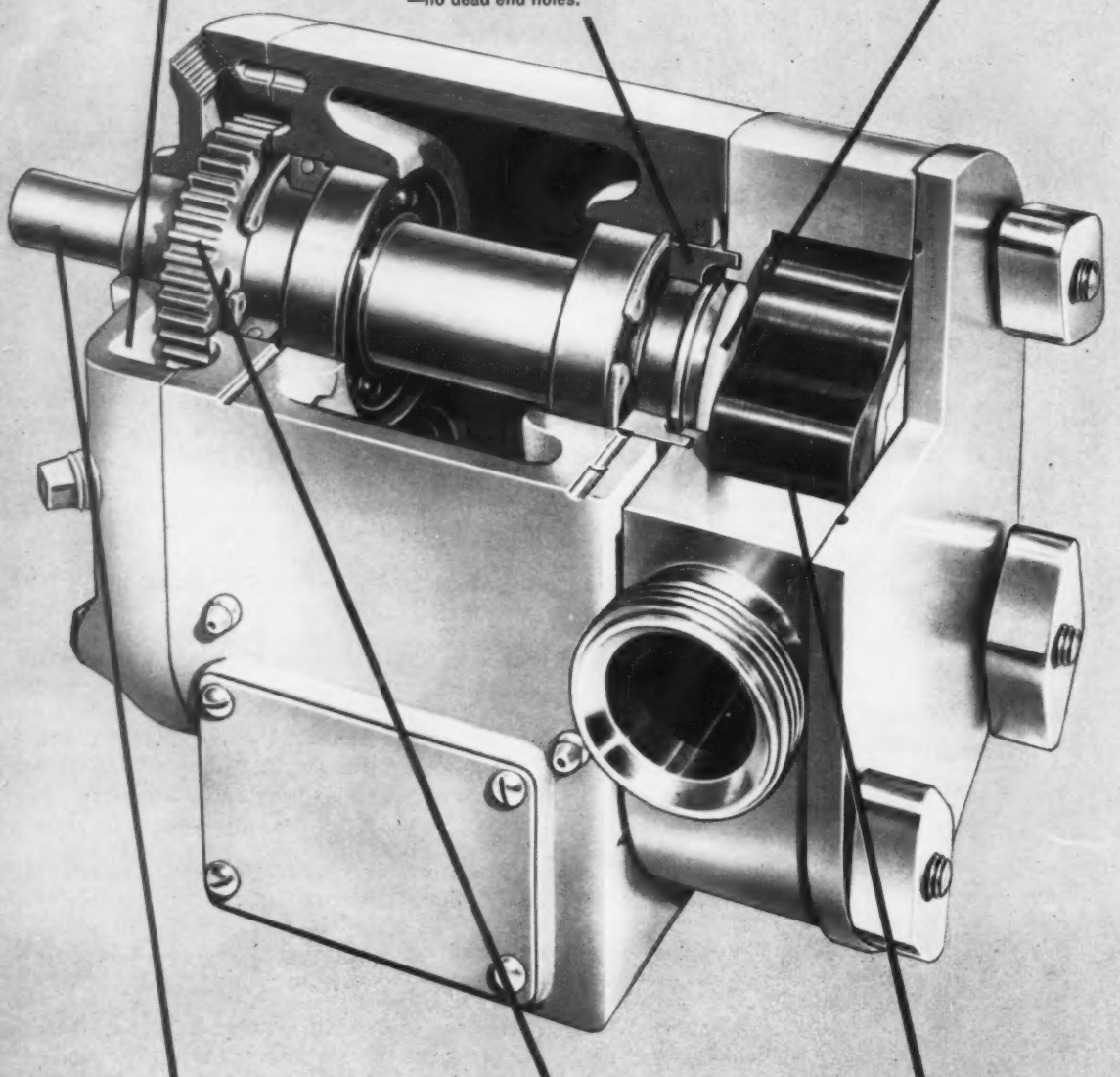
Gears are located in their own case attached to, but separated from, the bearing housing and operate in oil. Grease lubricated bearings are of the flushed through open type.

LOCATING RINGS

Pump body and bearing housing perfectly and easily aligned, thus maintaining correct clearance in pumping chamber. Pump body easily removed (no "cocking" or binding). Large wearing ring area provides added service life (maintains required alignment). Sanitary —no dead end holes.

STATIC, SANITARY, O-RING SEALS (Pat. applied for)

Rapid wear (with accompanying product or air leakage) eliminated. No movement of O-ring against sealing surfaces. Operates against vacuum or pressures, without reversing the O-ring. Removed without special tools.



SPLINED SHAFT

Large, double key splined shaft for strength. Permits easy, quick assembly and disassembly. Prevents incorrect impeller assembly. Allows easy interchange of impellers in the field . . . from top shaft to bottom shaft, back to front . . . without special tools.

GEARS AND SHAFTS—TIMING

Gears and shafts pre-timed at the factory. Either one or both gears and either one or both shafts may be replaced easily and quickly in the field by any mechanic. Gears can be removed without removing shafts and/or bearings.

FLOATING IMPELLERS

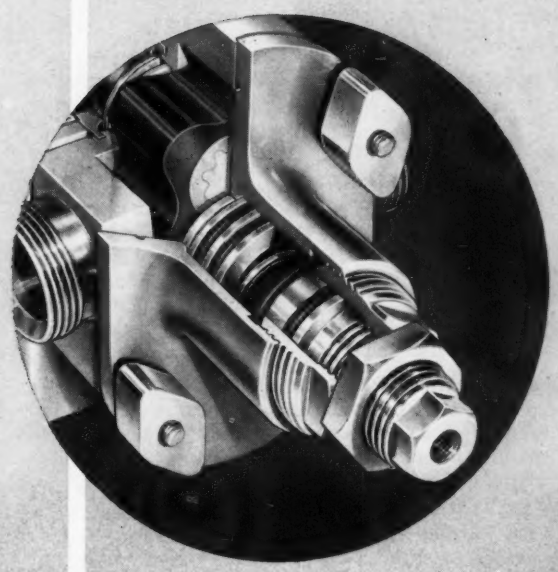
Single or four lobe types available to handle any product or flow requirement. No threads, hubs or inaccessible, hard-to-clean recesses in product zone.

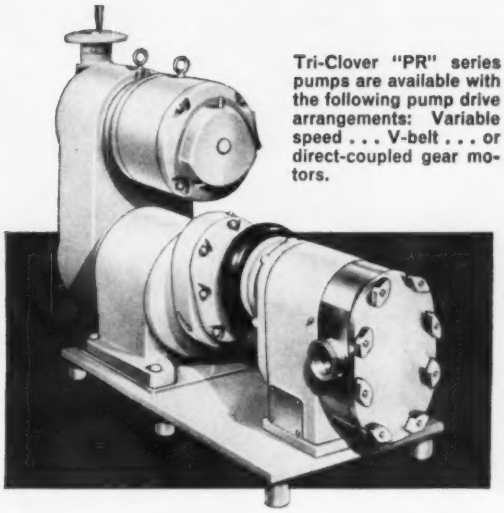
with you in mind . . . the NEW

POSITIVE PUMP

RELIEF COVER* (shown below)
Simple piston type design. No recesses, pockets or dead ends for product contamination. Self-cleaning during operation. Either spring or air actuated. Positive control of product flow.

*(PAT. APPLIED FOR)





Tri-Clover "PR" series pumps are available with the following pump drive arrangements: Variable speed . . . V-belt . . . or direct-coupled gear motors.

In designing this new high-efficiency "PR" Series Positive Pump, Tri-Clover engineers *began* where others left off. The exclusive features shown on the opposite page are engineered to provide you with the positive pumping efficiency needed to help you reduce processing costs, boost output and keep cleaning and maintenance expense in line.

These compact, efficient Tri-Clover Positive Pumps are available in 3, 10, 25, 60, 125 and 300 GPM units—and are also available for bulk pick-up tankers.

For further details, write for Bulletin PR-260.

TRI-CLOVER

LADISH CO.
Tri-Clover Division
Kenosha Wisconsin

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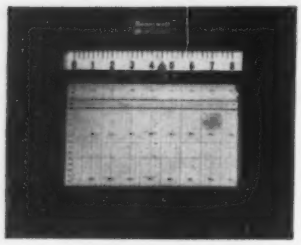
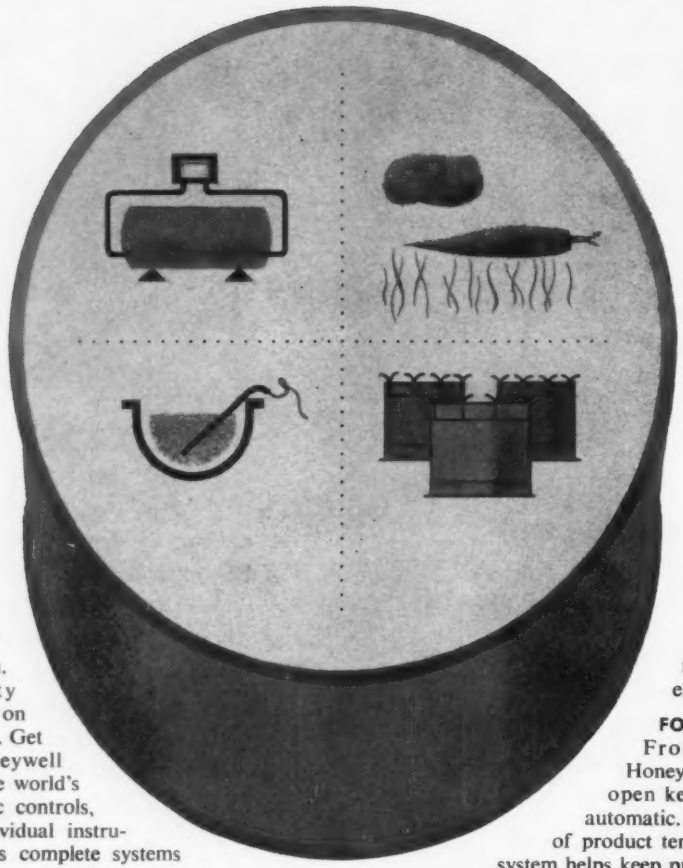
P161

Honeywell complete food processing instrumentation



- Zone-Control Blanching
- Fast Automatic Peeling
- High-Yield Open Kettle Cooking
- Packaged Retort Control Systems



PAYS OFF IN CONSISTENT QUALITY FOR YOUR CANNED FOODS

The selling power of canned goods is only as good as the consistency of the quality from can to can. Only consistent quality brings sound profits based on real consumer acceptance. Get this quality with Honeywell instrumentation. From the world's largest line of automatic controls, Honeywell furnishes individual instruments and custom-designs complete systems to regulate virtually every canning process.

FOR BLANCHING. Honeywell instrumentation ensures the proper fixing of color, taste, and firmness of the finished product by providing precise control of blanching temperatures. This instrumentation automatically compensates for varying input temperatures, load rates, and other factors by separately controlling the temperatures in both the inlet and outlet zones.

FOR PEELING. By closely controlling process variables such as temperature and solution concentration, Honeywell peeler control systems reduce process costs and eliminate product waste.

FOR OPEN KETTLE COOKING. From filling to draining, Honeywell control systems make open kettle cooking completely automatic. Also, the accurate control of product temperature provided by the system helps keep product yield high.

FOR HORIZONTAL AND VERTICAL RETORTS. Honeywell's approach to retort instrumentation is characterized by simplicity and low cost. By offering a number of packaged control systems using the same basic instruments, Honeywell simplifies the development and altering of automatic retort systems.

Your nearby Honeywell field engineer will be glad to discuss all your instrumentation requirements. Call him today. MINNEAPOLIS-HONEYWELL, Wayne and Windrim Avenues, Philadelphia 44, Pa.

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First in Control

SINCE 1885

HONEYWELL INTERNATIONAL Sales and Service offices in all principal cities of the world. Manufacturing in United States, United Kingdom, Canada, Netherlands, Germany, France, Japan.

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Schedule of Events

July

18-21—Nat'l Food Distributors Assn., meeting, Commodore Hotel, NYC.
24-26—Internat'l Apple Assn., meeting, Hotel Sherman, Chicago.
25-A10—Chicago International Trade Fair, McCormick Place, Chicago.

August

20-23—Nat'l Assn. for the Specialty Food Trade Inc., Nat'l Fancy Food & Confection Show, Hotel Astor, NYC.

September

11-13—Second Biennial Symposium on Foods, Oregon State Univ., Corvallis, Ore.
23-28—Master Brewers Assn. of America, meeting, Hotel Queen Elizabeth, Montreal, Canada.
25-28—Industrial Bldg. Exposition & Congress, New York Coliseum, NYC.
26-28—Sanitation Maintenance Show, Hotel Sheraton, Philadelphia.

HORS D'OEUVRES

Do-gooders charge that water in hams sells at the price of meat. Such economic ignorance! Competition long ago dewatered the price.

Food for Peace shipments of 12 million tons a year saves taxpayers $75 million in annual storage bills. Maybe there is something to the idea of giving the country back to the Indians!

Horn & Hardart will sell liquor in Manhattan. Hope they have bottles in coin-windows. Would be alluringly like the jug on the stump in Prohibition days.

Ratio of women to men in U. S. has risen to 100 to 97. Some good cooks going begging.

Citrus-flavored seltzer tablets are coming. Hope the flavor lasts through the rebound.

'Tis National Hot Dog Month. It's light hidden too long under a bun, the dog is social climbing as an ingredient in gourmet dishes. But is it better to be a little piece in a big dish or a whole dog in a small hand?

Russian scientists propose to draw herring across the paths of trawls by the attraction of flashing lights. A good twist on Mr. K's old red herring trick.

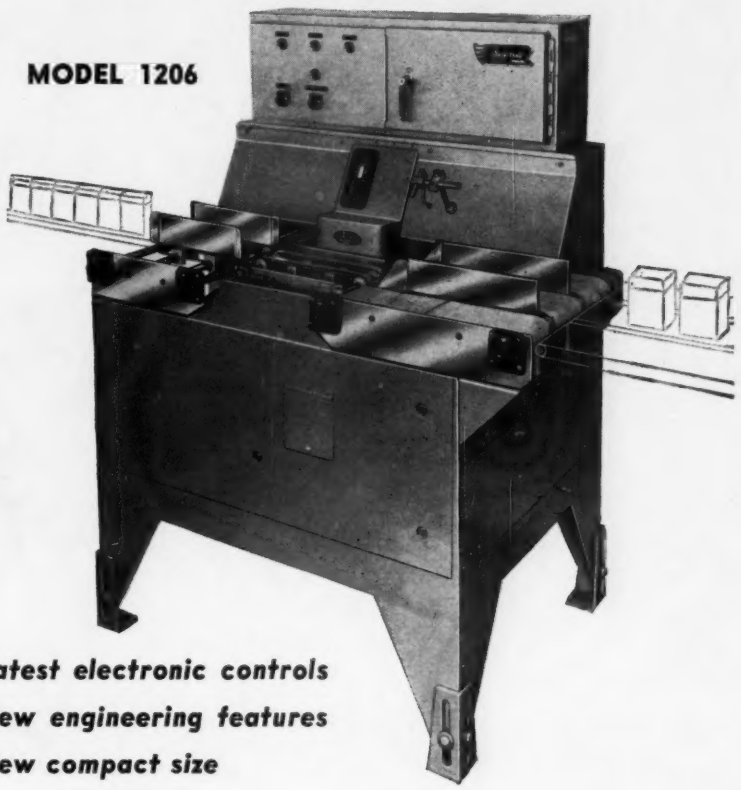
If management always studied problems as carefully as when they program them for a computer, the computer might not be necessary.

Psychology is an important ingredient of 900-calorie diet items. 'Tis much easier to stop after drinking a premeasured meal than to push one's self away from a table still loaded with goodies.

Ladies don't like to be watched by neighbors when they select low-cost food items in a supermarket. So it is sneakermarkets we need, yet.

SELECTROL® Automatic CHECKWEIGHER

MODEL 1206

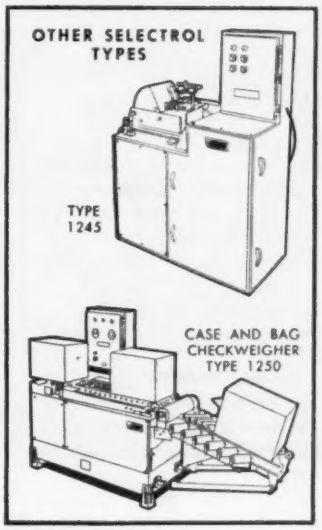


Latest electronic controls
New engineering features
New compact size

This new Selectrol checkweigher automatically weighs, classifies and sorts at speeds up to 120 items per minute, depending on size and weight of object. Rejection accuracy is 2/10 of one percent of the weight of the commodity at maximum speed.

New Selectrol features include compact size that requires minimum space in a conveyor line . . . and simplifies circuits. Electrical controls are mounted above the conveyor line for easy accessibility.

Selectrols are made by Extra Weight, a leading manufacturer of job-engineered scales for 45 years with experience gained through hundreds of checkweighing installations during the past 20 years. For complete details, write for Bulletin 3377.



Exact Weight SCALES

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Put it all together, it spells *SERVICE*

Fast, dependable delivery. Years of experience. These are the extra dimensions Miles adds to the versatile talents of citric acid.

Miles has developed a unique deep-fermentation process which produces citric acid in quantities that assure you of a steady supply. Shipments — small quantities or large — are made from more than 70 warehouses, strategically located and abundantly stocked. This means extra insurance for you against

production bottlenecks and shortage of supply. Add to this Miles' years of experience in applying citric acid in the production of foods, beverages, pharmaceuticals . . . and in using citric industrially.

This experience can be working for you; wherever you are, there's easy access to citric acid, hydrous or anhydrous, from Miles. Put this versatile acid — and the extra dimensions of Miles service — to work. Call or write today for more information.

MILES Chemical Company
Division of Miles Laboratories, Inc.
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THE MODERN EXPANDED FOOD COLORING CONCEPT

COLOR NOURISH

WITH VERSATILE

ROCHE *beta* CAROTENE

USE ONE PRODUCT TWO WAYS

COLOR

Give your oil-base and water-base foods color versatility and variety—from appealing pale yellow to hearty, appetizing orange—with Roche *Beta* CAROTENE.

NOURISH

Give your oil-base and water-base foods the nutritional-plus added by Vitamin A value in "the color that nourishes"—Roche *Beta* CAROTENE.

VERSATILE ROCHE *beta* CAROTENE

THE EXPANDED 2-IN-1 FOOD-COLORING CONCEPT

COLOR PLUS NUTRIENT

Vitamins come RIGHT from Roche

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DEVELOPMENTS TO WATCH

Puffing droplets by gas injection at 2,000 psi. speeds spray drying in new USDA process. Liquid first is concentrated to 40 or 50% solids. Key to process is accurate control of density and size of particles. USDA developed it to dry cottage cheese whey.

Wilson has expanded freeze-drying at Omaha. This plant processes ground, diced and sliced beef, chicken, and meat bars for military and commercial customers—plus meats and shrimp for campers.

Gerber has installed freeze-drying facilities in California plant. Another firm is freeze-drying spices experimentally. Irish Sugar Co. is producing freeze-dried foods for world markets.

Quick-serve freeze-dried meals likely will replace large percentage of combat rations now being packed in tin.

Foods containing no-calorie cellulose, Avicel, will be in supermarkets early this fall. Ingredient is approved by FDA.

Mild sour cream with long storage life and suitable for variety of fruit flavors has been developed at Cornell.

Some supermarkets are installing cookie plants, another threat to commercial bakeries. From dough prepared at central plant or by local baker, 11½-ft. machine forms and bakes cookies.

Vending of food packed in glass containers is under development.

Packaging materials can be sealed ultrasonically, without clean surfaces. New tool vibrates at 20,000 cps. to heat materials internally. Ultra Sonic Seal, New York, makes it.

Coca-Cola is testing polyethylene bags as shippers for syrup. Portion-control syrup packaging is under consideration.

Vinyl plastic bag holding 25,000 bu. is being tested for grain storage at Kansas State, both above and under ground.

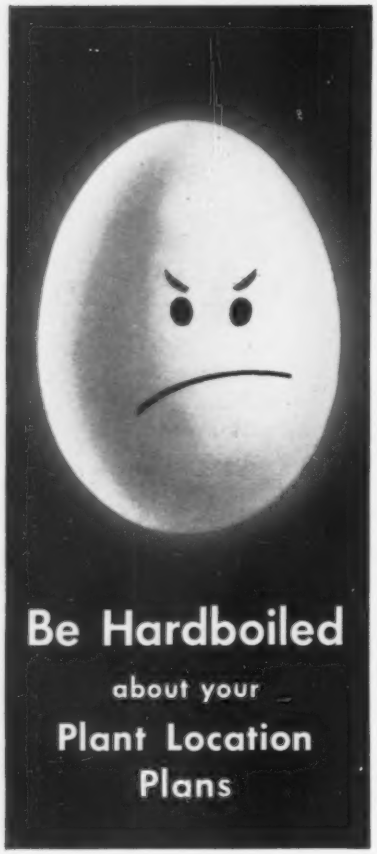
See Who's Building What p. 16

Spray containing 1 ppm. of new antibiotic phleomycin controls rust disease of snap beans, USDA researchers find.

Washington Report p. 21

New freestone peach variety with unusually firm flesh for shipping has been released by USDA. Flesh is yellow, fine textured, and good for canning, freezing, and fresh market sales.

Sales life of potato chips is boosted 50% by packing in cellophane treated with antioxidant, says Olin-Mathieson.



We like to work with hardboiled plant location people. The harder-boiled the better. That's because we can prove the Toledo-Northwestern Ohio area offers unmatched opportunities for Food Processing Industries. Our proof is contained in a survey of the area by Fantus Research, Inc., one of the nation's foremost industrial location services. For more information, write or call R. E. Johnson, Manager, Industrial Development Department, The Toledo Edison Company, Toledo 1, Ohio

THE TOLEDO EDISON COMPANY
an investor-owned electric light and power company serving Northwestern Ohio

Who's Building What

Monthly Reports: These food firms will spend $34,619,514 for expansion.

Contracts Awarded

Ashmore Sausage Co., Jonesboro, Ga., meat processing plant, $125,000.

Colville Meats, Inc., Colville, Wash., meat packing plant, $132,968.

Consolidated Dairy Products Co., Seattle, Wash., milk processing & ice cream plant addn., $2,500,000.

Dairymen's Assn. Honolulu, Hawaii, dairy plant, $881,000.

High Plains Dressed Beef Co., Dodge City, Kan., meat packing plant, $234,-589.

Laura Lee Candies of Florida Inc., Miami, Fla., candy mfg. plant, $115,-000.

Pepsi Cola Bottling Co., Portland, Ore., factory addn., $110,000.

The Pillsbury Co., Denison, Tex., refrigerated & foods processing plant, $2,194,000.

Safeway Stores Inc., Richmond, Calif., frozen foods warehouse, perishable goods warehouse, bakery & distribution center, $3,318,000.

Proposed Projects

Blanton Smith Hatcheries, Nashville, Tenn., poultry hatchery, $120,000.

Borden Dairy Co., Ltd., Toronto, Ont., milk plant & offices, $1,200,000.

Bowling Green Coca-Cola Bottling Works Inc., Bowling Green, Ky., bottling plant, $150,000.

Burke Farmers Dairies Inc., Morgantown, N. C., dairy processing plant, $220,000.

California Peanut Co., Richmond, Calif., candy plant, $500,000.

Custom Apple Packers, Brewster, Wash., apple packing plant, $161,000.

Denton-Whitson Food Products, Denton, Tex., food processing plant, $425,-000.

Holsum Bakeries, Springfield, Mo., baking plant, $1,500,000.

Jordan's Ready-to-Eat Meats, Portland, Me., meat processing plant, $357,957.

Lubbock Packing Co., Lubbock, Tex., meat products packing plant, $600,000.

Merit Frozen Foods Corp., Wallingford, Conn., frozen foods plant, $250,-000.

Pet Dairy Products Co., Anderson, S. C., milk distribution plant, $250,000.

Ralston-Purina Co., Russellville, Ark., plant, $150,000.

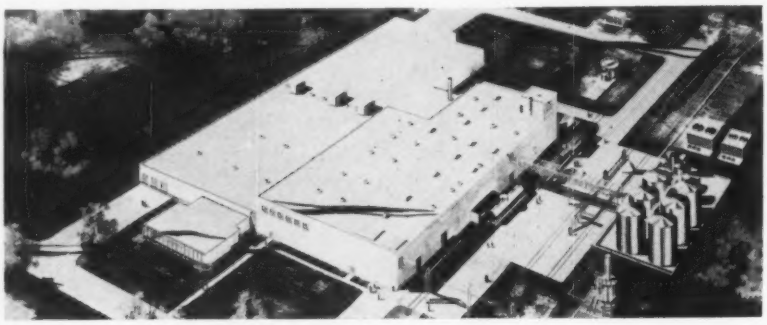
Safeway Stores Inc., Oklahoma City, ice cream mfg. plant, $250,000.

Spreckles Sugar Co., Fresno, Calif., sugar processing plant, $16,000,000.

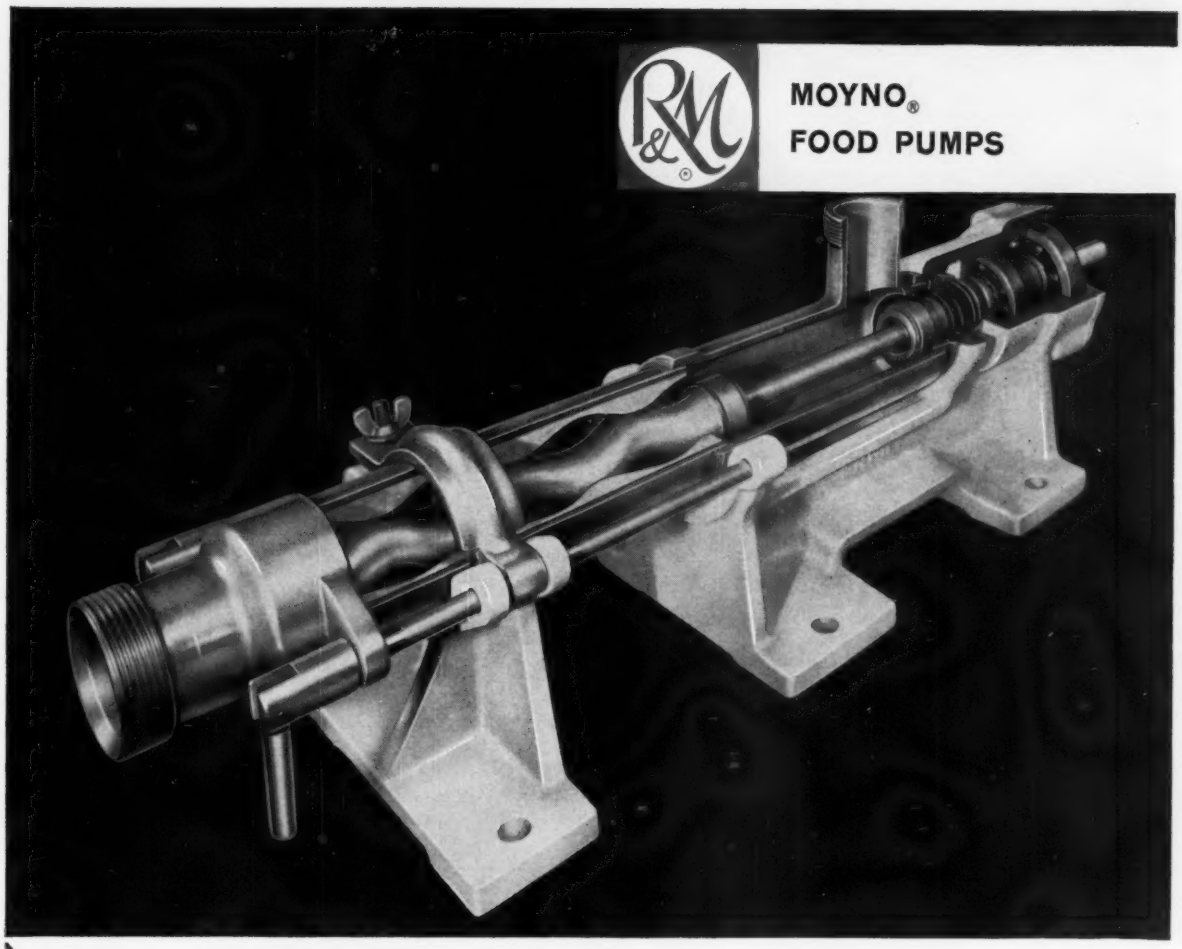
Tennessee Packers Inc. (Frosty Morn Div.), Montgomery, Ala., meat packing plant, $2,000,000.

Virginia Trout Co., Monterey, Va., fish hatchery & preparation plant, $125,000.

Western Farmers Assn., Portland, Ore., poultry processing plant, $750,-000.

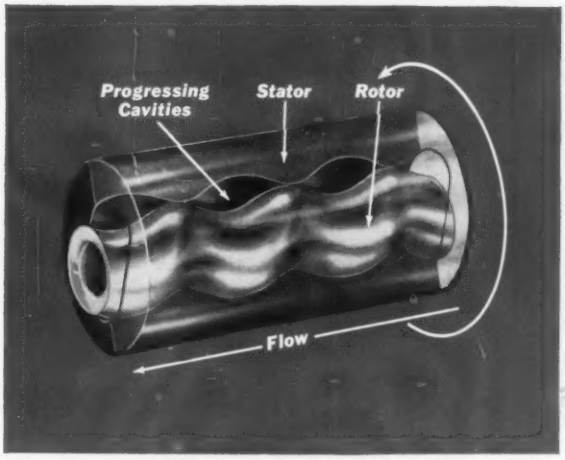


ARMOUR & CO.'S $6,500,000 PLANT for shortening, edible oil, and margarine processing is under construction in Kankakee, Ill. Unit will produce 150,000,000 lbs. of product annually and includes packaging-finished product, and office buildings, with oil storage facilities for 18,000,000 lbs.



A MOYNO® FOOD PUMP PUT *THIS* SHRIMP *IN ITS PLACE!*

On each cycle, this Moyno smoothly pumps 4 oz. of shrimp and tomato sauce into a jar. Moyno's "progressing cavities" keep the shrimp whole and never toss the sauce! Just as easily Moyno Pumps move all foods, ranging from thin soup to heavy peanut butter, without disintegration, pulsation, aeration or agitation. Their smooth rotor-stator contours can't lodge particles where bacteria might thrive, so food stays pure. And Moynos can be dismantled, thoroughly cleaned and reassembled in minutes. All wettable parts except stator are stainless steel. Stator can be stainless, synthetic rubber, bakelite or other material. Moyno Food Pumps are available in five sizes with capacities to 175 gpm and pressures to 75 psi. Write today for new Bulletin 100-FE



ROBBINS & MYERS, INC., Springfield, Ohio

Moyno® Industrial Pumps • Fractional and Integral HP Electric Motors • Electric Hoists and Overhead Traveling Cranes
Propellair® Industrial Fans • R & M-Hunter Fans and Electric Heat • Trade-Wind Range Hoods and Ventilators
Subsidiary companies at: Memphis, Tenn., Pico Rivera, Calif., Brantford, Ontario.

Profitable food products "GET-propelled"

Fast-moving food items get their sales speed from satisfied customers who keep coming back for more. Helping processors of fine foods improve flavor and texture has been CLINTON's business since before the invention of the shopping cart. More than 50 years of experience with products from corn is working on your side when you specify CLINTON CORN SYRUP, CORN STARCH, REFINED CORN OIL, LACTIC ACID and CLINTOSE BRAND DEXTROSE.

Technical service always available

CLINTON CORN PROCESSING COMPANY

CLINTON, IOWA

They can store and see unused portions in large-capacity Duraglas® containers

WHEN you package food for the institutional market in large-capacity Duraglas containers, you provide extra selling and user advantages. Unused portions store easily in the original container until the food is all used.

Easy-to-remove closures seal contents safely between servings.

And because the containers are clean, clear glass, the people in the kitchen can tell at a glance what's in the containers and how much is left.

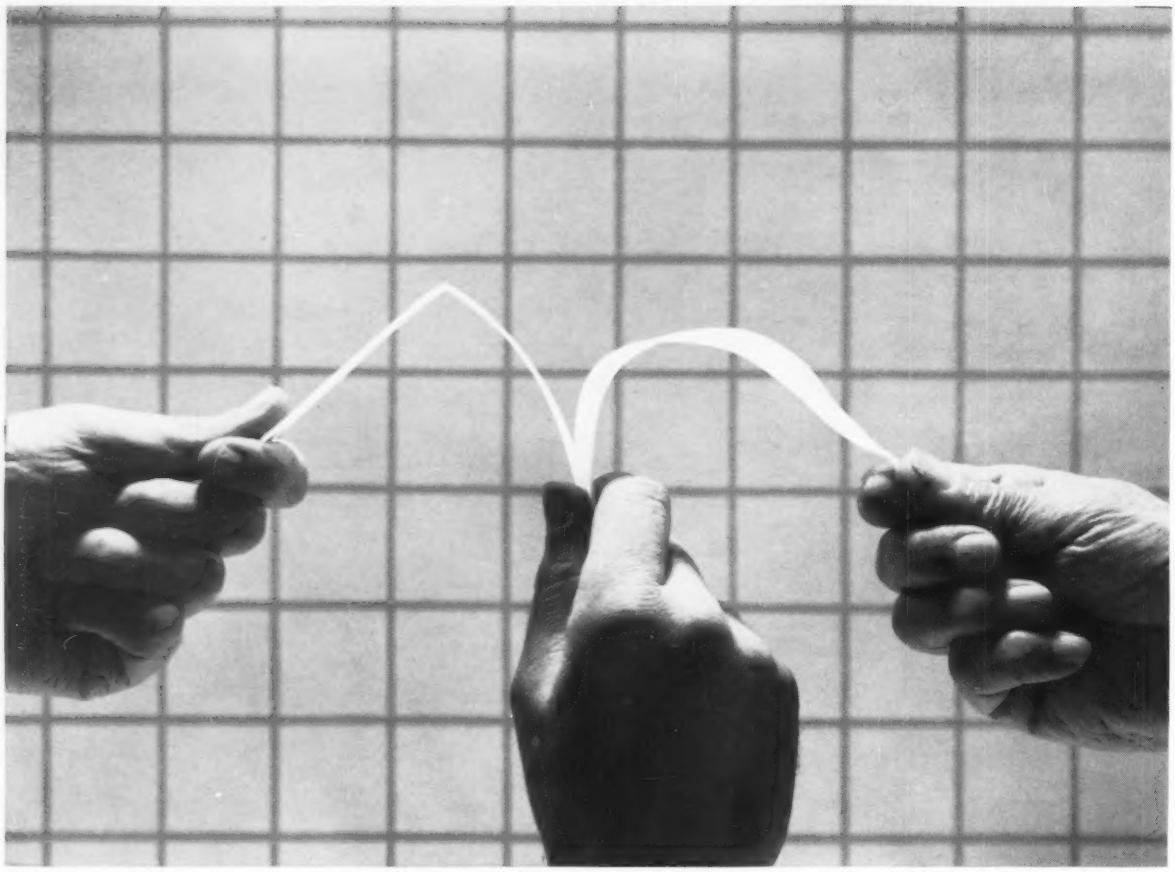
Glass, being inert, cannot affect the flavor and aroma of food either before or after the container has been opened.

To furnish this $8-billion and growing "eat out" market, look to Owens-Illinois for Duraglas jars to serve your needs best. Call the nearby O-I office or write to Owens-Illinois, Toledo 1, Ohio.

DURAGLAS CONTAINERS
AN (I) PRODUCT

OWENS-ILLINOIS
GENERAL OFFICES · TOLEDO 1, OHIO
PACIFIC COAST HEADQUARTERS · SAN FRANCISCO

CIRCLE 19 ON INQUIRY CARD



This is paraffin wax. Note its brittleness.

This only looks and feels like paraffin wax.

It's flexible, bars moisture, and is edible

New kinds of fats are entering the food industry under the name *Myvacet® Distilled Acetylated Monoglycerides*. They are officially recognized as edible, of course,* and are treated by the body as true foods. They are useful mainly for their physical properties: among others, are their pliability and ability to impart plasticity to other materials.

One of the new fats, *Type 7-00*, appears on the right above. Note how it is more flexible than paraffin at the same temperature. It also is a highly effective vapor- and oxygen-barrier. It melts at 99-104 F. Foods dipped in the melt come out with a pliant, skin-tight coating—an *edible* coating with an oxidative stability never approached by previously known fats.

Paraffin waxes plasticized with *Type 7-00* show greater resistance to cracking and chipping. They cling better to paper products.

Myvacet Distilled Acetylated Monoglycerides, Type 9-40, a liquid likewise resistant to oxidation, confers pliability on such diverse materials as hard fats and plastics. It, too, is edible. Chocolate-flavored coatings for candies and ice cream can be made more flexible at low temperatures with *Type 9-40*. This unique liquid can substitute for non-nutritious plasticizers in some plastics such as cellulose mixed esters and vinyls.

Organizations that like to look into developments of this importance early in the game should write to ***Distillation Products Industries,*** Rochester 3, N. Y. Sales offices: New York and Chicago • W. M. Gillies, Inc., West Coast • Charles Albert Smith Limited, Montreal and Toronto.

*U. S. Food & Drug Regulations, Sec. 121.1018

producers of ***Myvacet***
Distilled Acetylated Monoglycerides

DPi

Also . . . Myverol Distilled Monoglycerides . . .
vitamin A for foods and pharmaceuticals

Distillation Products Industries *is a division of* **Eastman Kodak Company**

Washington Report

Mexican berries plague packers . . Ice Cream stand-off . . Food packaging hit

Import Headache Worsens

Rising influx of frozen Mexican strawberries is sparking new demands for tougher import curbs. Shipments for the first 5 mos. this year (26.4-mill. lbs.) already exceed the total volume (25-mill. lbs.) that came here all of last year. A further irritant: Our export sales to Canada are being displaced by Mexican berries.

Imported straws carry a 14% ad valorem duty. Because Mexican wages are so low, it is claimed, importers can pay the duty and still sell at 4-6¢ below U. S. freezers' production costs.

Existing law requires imported foods to meet federal standards set for domestic products. But FDA can only spot-check incoming shipments, has no power over foreign plants. As a result of industry prodding, agency is now "actively considering" feasibility of new laws or remedies for making foreign plants meet same inspection requirements that domestic plants face.

Question Package-As-Salesman Role

Look for deceptive packaging to become as popular a Washington epithet as deceptive advertising is today. Sen. Philip Hart (D-Mich.), who heads a Senate subcommittee investigating misleading trade practices, says a **preliminary inquiry points to packaging and labeling as "the areas of greatest potential" deception.**

Last month, National Conference of Weights & Measures heard several speakers in and out of government rail against misleading package sizes, passed resolution calling on manufacturers to recognize their "moral obligation" to avoid misleading labels. And FDA Chief George Larrick, promising active support, told the delegates "we can help you by bringing legal actions where indicated."

Where Ice Cream Rules Stand

Stricter federal standards for ice cream production went into effect July 1. These provide that finished product must weigh 4.5 lb./gal., must contain not less than 1.6 lb. solids as well as (except for bulky-flavored items) 10% milk fat solids and 20% total milk solids.

Certain labeling requirements, plus prohibitions against cheese whey and treated skim milk products, have been stayed by a court appeal by International Assn. of Ice Cream Mfrs.

Big question facing packers, of course, is what to do where federal rules conflict with state standards. Most likely, courts will have to decide this one. **But, for the present, Washington sources say manufacturers would be safer going along with the federal standards (which are generally tougher).**

Tie Plant-Prying Bill to Elections

Supporters of wider factory inspection powers for FDA are shooting for public hearings in next year's session of Congress. Their aim is to move hearings closer to '62 elections—when "consumeritis" will dominate Washington.

Bills will probably be introduced by Sen. Magnuson (D-Wash.) and Rep. Harris (D-Ark.), chairmen of Senate and House Commerce Committees.

Tougher Cocoa Standards Set

Tighter standards for imported cocoa beans, which go into effect Feb. 22, '63, call for maximum 3% of moldy beans (now 5%) and 3% insect-infested beans (now 5%). FDA check of 6,000 samples from 32 countries showed need for tougher maximums.

Govt. Looks At 'Miracle Meals'

FDA feels that 900-calorie diets "appear to be satisfactory for the relatively short period" they are used, Commissioner George P. Larrick told recent meeting of The Nutrition Foundation. However, he insists, "the label should caution consumer to use the products under competent medical guidance."

Moist Hams Decision Near

As FE went to press, USDA was studying testimony from politicians, packers, retailers, and consumer lobbyists in regards to the watered hams regulation. **Congressmen who have been following the case feel that USDA will rule against the 10% moisture content allowed in interstate shipments.** Although industry cited surveys where housewives showed preference for moist hams, consumer groups raised a vigorous clamor over the issue.

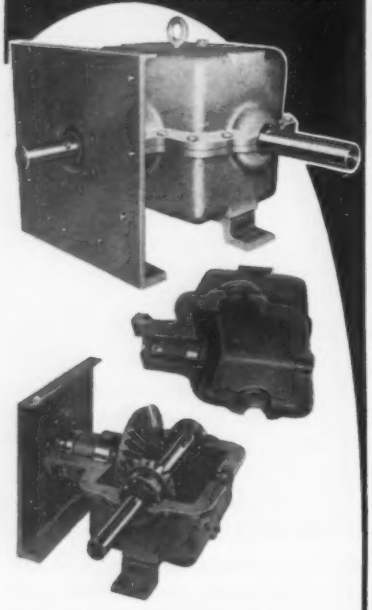
BRIEFS

Meat packers' bid to overturn the 1920 consent decree was denied once again by U. S. Supreme Court.

Tomato growers' prices are being probed by House Small Business subcommittee under Rep. Tom Steed, who a couple of years ago investigated the dairy field.

Import curbs on canned fruit (except for apples and citrus) were lifted by Great Britain. (Turn page)

dreadnaught
ENCLOSED COUNTERSHAFT ENDS for Screw Conveyor Power Transmission



—Most COMPLETE Line . . . Most ADVANCED Design by any American Manufacturer!

The rugged DREADNAUGHT gives continuous, dependable service even with long conveyor runs. Deep groove ball bearings absorb all thrust in either direction. Available for 6" to 20" diameter screw conveyors, in 1:1 and 2:1 ratios, and in all shaft combinations. Dust-tight and oil sealed, with moving parts readily accessible. Bulletin illustrating single and multiple drive combinations and containing complete specifications sent on request.

Another quality product of

SOUTHWESTERN SUPPLY and MACHINE WORKS
OKLAHOMA CITY, OKLAHOMA

Washington Report *(Continued)*

Nonalcoholic Carbonated Beverages are now required to bear a label declaration of ingredients, according to FDA announcement. Action was prompted by consumer demands.

FDA commissioner George P. Larrick says that a proposal for promulgation of standards of identity for vanilla extract is under consideration, but that there is no proposal for standardization of nonalcoholic carbonated beverages and none is contemplated in immediate future.

Frozen Mellon Balls have been sighted by USDA for standards revision. Proposals for dessert item which has recently seen increased consumer demand, would include frozen, balled product prepared from suitable varities of sound fresh melons.

New Lettuce Standards provide lower tolerances for defects at shipping point and higher tolerances en route or at destination.

Amendments to Poultry Inspection Regulations are proposed by USDA. One tentative change would permit young turkeys to be designated U.S. Grade A only if they have been held unfrozen for at least 12 hours after slaughter.

Frozen Peaches Standards have been revised to provide various labels of "character" — texture and ripeness — of fruit in each grade. Users may now specify particular character of product needed for particular use.

Proclamation by President, as a result of investigation by U. S. Tariff Commission, imposes absolute annual quotas on imports of Blue-Mold and Cheddar cheeses and substitutes for cheese containing, or processed from them.

Mayonnaise, French Dressing, and Salad Dressing may now contain oxystearin as a crystallization inhibitor by virtue of standards amendment passed by FDA.

FDA Gave OK to mono- and diglycerides as optional ingredients in ice cream, french ice cream, ice milk, and fruit sherbets.

Guides to Permissible Radioactivity Concentrations in dairy products and other foods are contained in an AEC report released through Office of Technical Services, Business and Defense Services Administration, U. S. Dept. of Commerce, Washington 25 D. C.

Peanut Butter Standards Revision is proposed by USDA. Proposal incorporates color guides to be made of colored plastic and available for sale for easier and more accurate color evaluation. Minimum and maximum limits for added salt are included with new scoring factor of consistency and a definition of stabilized and nonstabilized types.

FE's Box Score on Key Legislation

BILL	SPONSOR	OBJECTIVE	COMMITTEE
HR 6970	Berry	Provide minimum $2/bushel support price for '61 wheat crop.	Agriculture
HR 7320	Vanik	Encourage anti-pollution steps by allowing cost of treatment works to be amortized at accelerated rate for income tax purposes.	Ways & Means
HR 7335	Dague	Amend Packers & Stockyards Act in regards to sale of livestock.	Agriculture
HR 7623	Dague		
HR 7480	Harvey	Provide additional research facilities at State agricultural experiment stations.	Agriculture
HR 7417	Reifel	Amend '48 Sugar Act to provide bigger quotas for domestic producers.	Agriculture
HR 7628	Rogers		
HR 7538	Short	Create wheat research lab in N. D.	Agriculture
HR 7654	Miller	Impose 10¢/lb. import curb on mutton, lamb; $1.50/head on sheep and lambs.	Ways & Means
HR 7702	Blitch	Set up national hog cholera eradication program.	Agriculture
HR 7715	Miller	Amend Agricultural Adjustment Act relative to marketing of apples.	Agriculture
HR 7795	Sikes	Direct Interior Secty. to determine means of improving conservation of game and food fish in dam reservoirs.	Marine & Fisheries
S 1799	Humphrey	Impose graduated tax on taxable income of corporations.	Finance
S 1800	Humphrey	Amend Clayton Act as to when actions under sect. 4 or 4A can begin.	Judiciary
S 1801	Humphrey	Amend Clayton Act to declare private antitrust suits to be "impressed with a substantial public interest."	Judiciary
S 1802	Humphrey	Require publication of proposed consent decrees, judgments, and orders in Federal Register with 30 days' notice.	Judiciary
S 1803	Humphrey	Allow parties injured by loss-leader practices to sue for triple damages.	Judiciary
S 2066	Keating	Amend Agricultural Adjustment Act relative to marketing of apples.	Agriculture

CIRCLE 22 ON INQUIRY CARD
CIRCLE 23 ON INQUIRY CARD →

Now! TART gelled sauces!

Make them with the only pectin that gells without sugar

Imagine—a tangy gelled fruit sauce! Many new, and saleable gelled food products are made possible by EXCHANGE LOW METHOXYL PECTIN—the *only* pectin that forms a true gel without the need for sugar.

With L. M. Pectin you can produce a full line of gelled foods of any degree of sweetness—even sugar-free for diabetics and low-calorie dieters. Use it for aspics, relishes, low-calorie jams, fruit jells and desserts. They'll stay firm at room temperature, yet be tender, elastic and sparkingly brilliant.

Get full information—including technical data and formulas. Call your Sunkist man or mail the coupon today.

Sunkist Growers

Products Sales Dept., 720 E. Sunkist St., Ontario, Calif.

Gentlemen: Please send data on use of Exchange Low Methoxyl Pectin in ( ) low-calorie jams ( ) aspics ( ) fruit jells ( ) relishes ( ) desserts ( ) sauces ( ) other.

NAME _____

ADDRESS _____

CITY _____ ZONE _____

STATE _____

Exchange

LOGO ASSURES IDENTITY

TWIN CHEESE PACK

new packages & products

CONSISTENT SHIRRIFF LOGO ASSURES BRAND IDENTITY

Greater eye appeal plus strong and consistent brand identification are expected with new package designs introduced for Shirriff dessert products, marmalades, and jellies, Canadian products of Salada-Shirriff-Horsey.

More modern Shirriff logo and appetizing pictures of fresh fruit highlight the new design. Though similar for three product groups, labels are distinguished by color and shape. Caps carry a cross-sell message for other products.

'PROPEL-PAK' AEROSOL

'SERVE 'N SAVE' PACKAGE FOR SLICED CHEESE LINE

Armour Star Miss Wisconsin sliced cheeses are now being dressed up in "serve 'n save pak" packages that consist of two individually-sealed but joined sections of transparent film.

Each section of the 8-oz. package contains four slices. In use, one section may be opened while other remains sealed until needed.

Package also introduces new labels featuring a four-color Wisconsin scene and a stylized milkmaid sharing prominence with enlarged Armour Star logotype.

NEW AEROSOL FOR FOODS NEEDS NO REFRIGERATION

Almost indefinite storage of concentrated milk products, orange juice, and other liquids without refrigeration was forecast by a Florida firm, following award of a patent on a new pressurized package for dispensing beverage concentrates.

New "propel-pak" provides instant and lasting reconstitution of wide range of concentrates. And laboratory tests show that natural flavor and vitamin value is retained without spoilage, according to supplier, Continental Enterprises, Inc., Jacksonville.

Three "propel-pak" flavored syrups are reported to have been successfuly test-marketed in Jacksonville and Cleveland. Food processors will be offered franchises for brand-name use of the patent with milk, pure fruit juices, water flavorings, carbonated beverages, soups, and other liquid food concentrates. **(311)**

REUSABLE PLASTIC COVER HAS DRIPLESS SPOUT

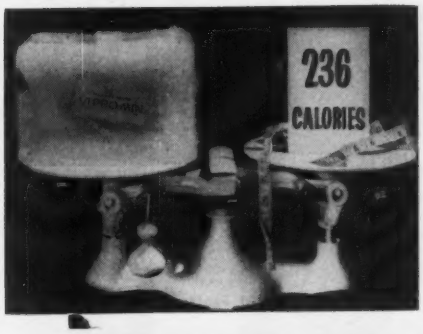
Reusable closure-dispenser for syrup, juice, canned baby formula, and other products employs a spout to eliminate dripping and dribbling.

Hershey Chocolate Corp. is using the polyethylene cover as a premium offer for chocolate

DRIPLESS CLOSURE-DISPENSER

DIE-CUT FOIL FOLDER

FROZEN DIETARY CONCENTRATE



FROZEN MUFFINS IN FOIL

syrup. Customers receive two of the "Pour-N-Seal" tops, described on can labels, for 25¢.

A plastic cap is snapped on after the can end has been punctured or cut out. A unique venting system keeps can contents from surging and allows the device to be taken apart for easy cleaning.

Available in several can sizes, the DuPont Alathon constructed dispenser is produced by Siax Industries of Mass., Newton Highlands, Mass. **(312)**

POLY/FOIL PACKAGE PERMITS PRE-PURCHASE INSPECTION

A polyethylene bag with an aluminum foil folder which can be lifted to permit inspection of meat prior to purchase is being used for several pre-packaged products from Hebrew National Kosher Foods, Inc., N.Y.C.

Die-cut arrow in folder permits inspection and also points to product name. Entire poly bag can be placed in hot water.

Foil box is supplied by United Board & Carton Corp., N.Y.C. **(313)**. Poly bag is applied via a Flexvac machine from Standard Packaging Co., Clifton, N. J. **(314)**

FROZEN DIETARY SUPPLEMENT DEBUTED AS CONCENTRATE

Vi-Pro-Min, offered by Minute Maid in a 6-oz. can that reconstitutes to 18-oz., is said to be the first dietary supplement available in frozen concentrated form.

According to MM, product "offers a balanced and realistic weight control program that reduces calorie intake according to a safe, medically-approved principle. A day's supply provides a 236-calorie liquid nutritional supplement that permits a 1000-calorie evening meal."

Unusual name is a contraction of "vitamins, proteins, and minerals."

FROZEN MUFFINS READY FOR NATIONAL MARKETS

Frozen muffins, now being marketed regionally by Downyflake Foods, Inc., will go national later this year. Firm's blueberry, honeynut, corn and raisin-bran muffins are now in the New York, Philadelphia, and New England areas.

A unique six-muffin aluminum container, specially designed for Downyflake, solved the difficult problem of drawing and forming multiple-cavity containers from a single sheet of .003-in. gage foil. Cavities are each 1¼-in. deep, 1¾-in. wide at the bottom and 2½-in. wide at the top. Outside dimensions are 9-in. x 6-in.

Reusable container was designed by Kaiser Aluminum & Chemical Sales Co. **(315)**

MARS MAPS HALLOWEEN PUSH WITH 'JUNIOR' CANDY LINE

An aggressive Halloween promotion campaign by Mars, Inc., will be spearheaded by a new line of candies, the Mars 'Juniors.'

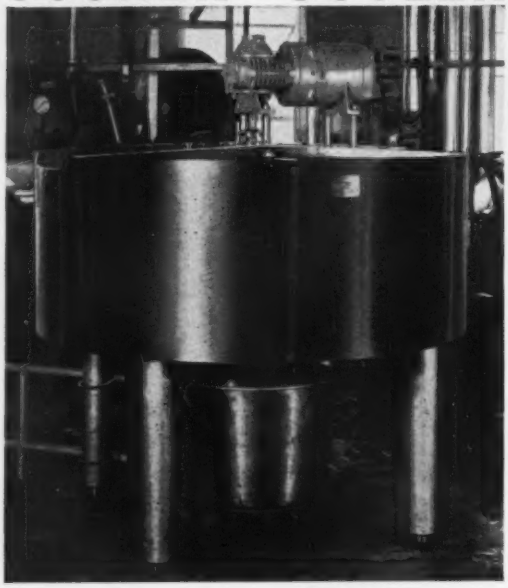
Milky Way, Snickers, and 3 Musketeers are firm's first products to appear in the Junior size. Smaller bars will be packaged in 1-lb. polyethylene bags.

Campaign will include TV,

'JUNIOR' MARS BARS

For more information, circle key numbers on Reader Service Card, back of book

CJ COOKER - COOLER



Cooks and Cools In A Single Two-Stage Operation

for Pastry Fillings

PASTRY fillings and other food products requiring similar processing may now be cooked *and* cooled in the new Chester-Jensen stainless steel Cooker-Cooler in a single two-stage operation. Cooking is accomplished by circulating low-pressure steam or hot water through a pressure jacket which surrounds the vat containing the product. Coolant is then circulated through the same jacket. Agitation to suit the product and assure rapid, uniform cooking and cooling is provided. Finished product flows from outlet at bottom.

Cooker-Cooler pictured processes all fillings for the exclusively premium grade products of Ebinger Baking Co., Brooklyn, N. Y. Here cooking and cooling time ranges from thirty minutes to one hour per 200-gallon batch, depending upon product and finished temperature desired. A second Cooker-Cooler is on order.

We will be glad to investigate your cooking and cooling problems and submit recommendations.

Chester-Jensen Equipment is Built Entirely in U.S.A.
BUY AMERICAN

CHESTER-JENSEN COMPANY

347 Tilghman St. (Dept. S) CHESTER, PA. INCORPORATED

Specialists in Stainless Steel Industrial and Food Equipment

CIRCLE 26 ON INQUIRY CARD

magazine, and billboard advertising "for the biggest Halloween support any candy ever had," according to Mars advertising officials.

DISPLAY SWITCH from supermarket shelf to dairy cabinet is expected to boost sales of Prunex Prune Juice from RIR Assoc., N.Y.C. Green container is made by Milk Container Div. of American Can Co. **(316)**

New Product Shorts

Duncan Hines has added Cherry Almond and Date Nut to its line of Early American cake mixes.

Welch Grape Juice Co. has begun a major TV campaign to push Fiesta Punch, a new fruit drink.

Ralph Schler, St. Joseph, Ind., has introduced orange and lemon flavored pickles.

Nestle Co. is testing Keen, a new instant soft drink mix in four flavors—lemonade, cherry, orange, and grape.

Packaging Briefs

Multi-Meter Div. of Rieke Metal Products Corp. is marketing Flo-Top, a bottle pouring spout which combines the features of a bottle cap with directional flow, a no-drip spout, and an open-close control. Two-piece cap is molded of high impact, virgin polyethylene. **(317)**

Nashua Corp. announces IMAC APC Label Paper, a new heat seal grade said to provide trouble-free adherence over a range of room temperatures and humidity from 45 to 115F. and from 20 to 80% RH. Paper replaces Nashua's Pervenac CL and IMAC PL grades used for labeling bakery products in film and other materials. **(318)**

CIRCLE 27 ON INQUIRY CARD →

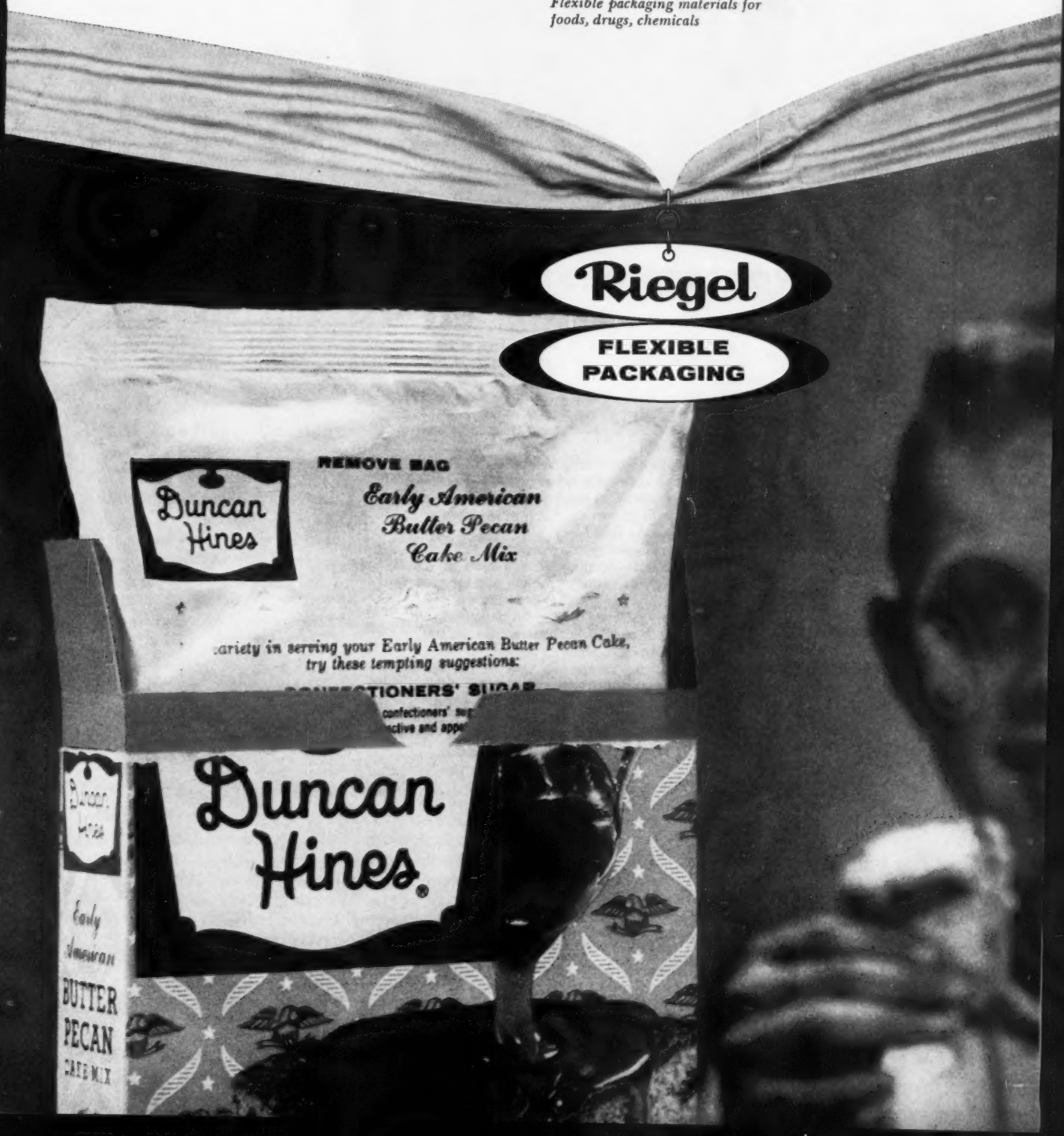
Duncan Hines... good old fashioned flavors protected in new-fashioned Riegel package

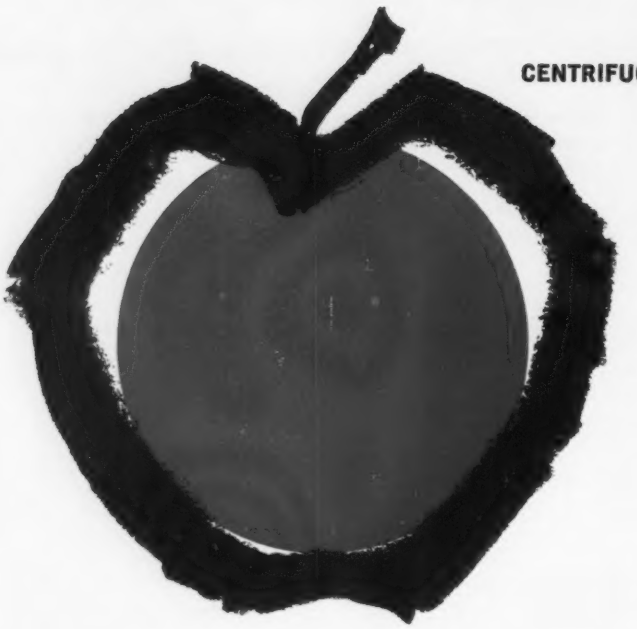
To protect the goodness of *Early American* Cake Mixes, Duncan Hines relies on a special lamination of glassine and polyethylene produced and printed by Riegel.

This package keeps delicate flavors, fine powders, shortenings and critical moisture content firmly protected.

We've a flair for thinking of every product as something special... and developing for it the one best packaging answer, be it pouch paper, glassine, foil, plastic, film or combination... printed, coated or plain. Write for more information today... for the new ideas come from Riegel.

Flexible Packaging Division
Riegel Paper Corp., 260 Madison Ave., NYC 16
Flexible packaging materials for foods, drugs, chemicals





CENTRIFUGAL SKILL AT WORK

THE WORLD'S BEST APPLE JUICE . . .

It's finer tasting . . . retains the essential flavor of the fruit . . . is free of impurities . . . and is enjoyed by increasing millions daily.

Not restricted to any single brand label, the world's best apple juice is the product of any company seeking to provide the consumer with the finest—and using the most modern processing method to do it.

Their secret for finest juice processing! The Sharples Super Conejector . . . the machine that employs high centrifugal pressure to extract the best from the apple—or any other fruit bound for juicing.

What makes the Super Conejector better? First, its high capacity continuous operating efficiency at a substantial saving in labor—centrifugal pressure forces the skin to its outer wall, uniformly extracting the juice without the "grinding" effect of conventional methods. Secondly, yields are greater. The Sharples Super Conejector centrifugally "squeezes" the last drop from the pulp.

But—whether you have been squeezing, mashing, pulverizing or otherwise extracting juice from fruit—you owe it to yourself and the consumer to investigate this unique concept in fruit juice processing by Sharples.

We would be pleased to show you how to put the Super Conejector to work in your plant. It's Sharples Centrifugal Skill at Work—for finer products and greater profits in your processing operation.

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Centrifugal and Process Engineers

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Packaging Pointers

'Cans don't dent' . . . Price-letting in wraps . . . FDA green lights cello, poly

Packers Deny Soft Can Problem

Frozen orange juice concentrators polled by FOOD Engineering last month unanimously denied reports that retailers were finding it difficult to open cases of new aluminum packs without cutting the cans. Pasco Packing and Winter Garden Citrus Products Co-op, two of the biggest Florida freezers, said no such complaints had been received from their customers—which include many large volume buyers.

H. P. Hood & Sons, marketing a composite foil can, said it is experimenting with tear-strip cartons to ease the case-opening problem. The firm plans a new shipper for next season where the tear strip will receive adequate marking all the way around the box.

Makes Package Match Market

A two-level type of packaging committee keeps Stouffer Corp.'s packages abreast of changes brought about by market expansion, Marketing Director James M. Biggar told a recent American Management Assn. seminar.

An inner hard core group consists of Biggar, ad manager, head of quality control and product development, and chief purchasing agent. This inner group is joined, from time to time, by the outside design consultant, production manager, industrial engineer, and machine design engineers.

"Action meetings" are attended by both of the company's major carton suppliers. These outsiders receive minutes of the action sessions so that they can implement the decisions into package changes, Biggar explains.

What Does the Consumer Like?

Can and bottle makers are probing consumers up and down the country as part of their battle for the soft drink business.

A poll by the Home Makers Guild for Owens-Illinois' glass division found one-way bottles cited by 46% as the preferred beverage container. Check of 1,175 respondents also found 24% favoring deposit bottles, 11% cans, and 19% "no preference."

A somewhat different picture, naturally, emerges from a head count of just under 800 people by the Psychological Corp. for Continental Can. Almost one-fourth, or 24%, of the adults who had tried all container types voted for the cans, vs. 62% for bottles, and 14% for either cans or bottles. Among teenagers, 27% favored the can.

First Food Test for New Coating

Bakery items have passed initial trials with the recently introduced Daran-coated board, reports Potlach Forests. Coatings, developed by W. R. Grace's Dewey & Almy, is a water-based polyvinylidene chloride that has been widely used as barrier packaging in films and as a solvent coating for cellophane.

FDA OKs Cello, Poly—at Last

Two of the food industry's favorite films—cellophane and polyethylene—finally won FDA's seal of approval. Both materials had previously been used under provisional clearance.

On the face of it, poly stands to gain more than its rival. While cello producers say that no food firms had held back from using the film in the provisional stage, U. S. Industrial Chemicals' William Marsh, vice pres., concedes that "many food processors preferred to await FDA's formal OK."

FDA drew one exception in its ruling. Agency exempted boil-in-bag pouches, will come up with separate regulation for them later.

Price Cuts in Wraps

Intense scrambling among flexible films has led to another wave of price shaving. Goodyear clipped 6% off the price of Vitafilm. Price cuts of 3¢ to 5¢/lb. by Hercules, W. R. Grace, and Phillips Chemical, dropped hi-density poly down from 38¢ to 35¢/lb., and medium density down to 32½¢-33¢/lb. Later, AviSun reduced polypropylene to 64¢/lb. to maintain the regular spread with other flexibles.

Report on Glass Containers

One reason behind the upward surge in popularity of half-gallon milk jugs is hinted at in the just-out annual report of Glass Container Mfrs. Institute. Says GCMI: Some firms indicate that **large size milk bottles serve for as many as 75 to 80 trips compared to 34 for the usual quart bottles.**

BRIEFS

Greater strength for pressure and vacuum resistance are claimed by National Can for its newly-developed tri-cluster beaded tins.

New edition of its popular "Glossary of Packaging Terms" has just been published by Packaging Institute, New York City.

Local saturation campaigns in 24 key markets spark U. S. Steel's promotion of canned soft drinks this summer. Company contends that 43% of nation's bottlers now offer tinned pop **(as against** 25% in '59).

PURITY 69

FROM BABY FOODS TO FROZEN PIES...

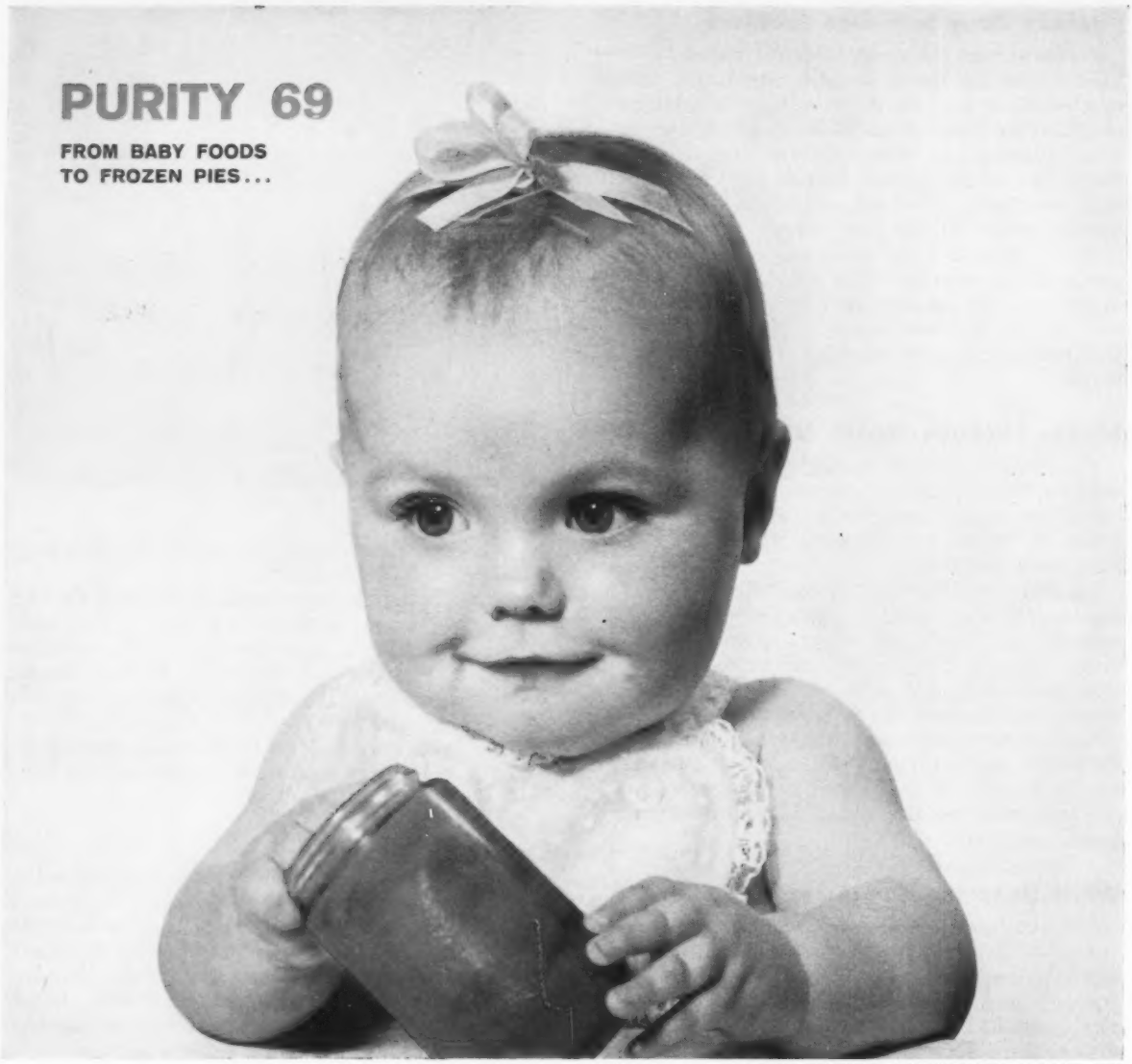

Illustration courtesy of GLASS CONTAINER MANUFACTURERS INSTITUTE, INC.

"FRESH FOOD LOOK" after months of storage

PURITY 69 prolongs storage and shelf life far beyond normal requirements! Stabilizes fruit fillings over a year at refrigerator temperatures while other specialties break down after a week or two. Withstands as many as 40 freeze-thaw cycles while other specialties weep and cause texture changes after two to five "freeze-thaws".

PURITY 69 also offers superb gourmet qualities in taste, texture and clarity. A simple taste-color comparison shows the difference.

PURITY 69 should be evaluated wherever smooth heavy-bodied texture, lack of cereal taste and exceptional shelf-life are desired. Suggested for all types of frozen specialties, canned and jarred foods, canned pie fillings, fruit desserts. Write for information.

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And All Principal Cities in the United States, Canada and Mexico

Robot Picker Brings Big Benefits and Problems

Mechanical harvesting of fruits and tomatoes for processing is coming fast. With it are coming new problems.

Highest single element in tomato costs is harvesting. It represents about one-third of the total, according to Mr. W. B. Murphy, president of Campbell Soup. There are tremendous cost savings in gathering fruit, too.

Eliminates seamier side of life

But cost reduction is not the only benefit. Most harvesting is done by migrant labor—"one of the seamier sides of our fine American life," to quote Mr. Murphy.

If you ever picked cherries you appreciate at a glance the economic significance of the machine method. When the tractor-borne, hydraulically operated steel "hand" grasps a major branch and shakes, all the cherries on that part of a tree come tumbling down. They fall onto shock-breaking canvas, roll into a conveyor, and are mechanically discharged into water in tank-trucks for delivery to the plant.

But mechanical harvesting is a one-pass proposition. It picks green and ripe and good and bad at the same time.

This poses challenges to horticulturists and to food technologists. Plant genetics must come up with more uniform ripening. Food technologists must enlarge the plant inspection operation and make it more efficient and faster. At the same time, they will have to find valuable uses for rejected raw materials. Pickled green tomatoes, maybe?

It is to be expected that great improvement in the total quality of mechanically harvested fruits and tomatoes will be made in the next few years. Extensive research is being done in this direction. Special techniques, such as hydrocooling the harvested fruit with iced water or air blast to reduce deterioration, will be utilized.

Tree and vine quality better retained

In the end, tree and vine quality will be better retained until it is preserved by processing.

Meanwhile technologists can afford no compromise with quality while the switch from hand to mechanical harvesting takes place. Nor can there be any delay in developing waste-saving uses for rejected raw materials.

True, processors are encountering higher costs as a result of machine damaged raw material. But we agree with a Yuba City fruit grower. He says that this may be considered the processor's contribution to the overall cost of mechanization.

'Tis a case where savings are so great that extra expenses are more than justified. And think what the savings will be when Teamster Union Hoffa dictates the pay and the workhours of hand picking labor!

CONTROL SPOILAGE LOSSES WITH NEW DOW CHELATING AGENT

A NEW APPROACH to problems caused by trace metal ions in food is now available. Versene® CA chelating agent is calcium EDTA (calcium disodium ethylenediaminetetraacetate dihydrate)—a product developed specifically for the food industry. It chemically inactivates troublesome metal ions such as iron, copper and nickel. Such ions, unless controlled, can cause formation of undesirable precipitates and complexes and catalyze oxidative degradation.

UNWANTED PRECIPITATES AND COMPLEXES are widely encountered in food products. Insoluble, needle-like struvite crystals frequently form in canned seafood, decreasing customer acceptance. Complexes of heavy metals appear to be a cause of "gushing" or "wildness" in beer and cloudiness and sedimentation in wine. Versene CA chelating agent solves both these problems. In addition, it may be utilized to eliminate the undesirable blackening caused in cauliflower, asparagus, and potatoes by iron complexes.

RETARDATION OF OXIDATION with Versene CA is an excellent method for stabilizing flavors and odors and thus extending the shelf life of food products based on fats and oils. Inactivation of metal ions not only eliminates the catalytic effect of the ions on the oxidative process, but also enhances the effect of anti-oxidants such as ascorbic acid. Versene CA has been shown to eliminate the white ring which commonly forms on the surface of French dressing during storage. Retardation of oxidation extends the shelf life of mayonnaise, salad dressing, margarine, nutmeats, and similar products.

FDA REGULATIONS on the use of Versene CA in sandwich spreads, malt beverages, salad dressing, French dressing, mayonnaise, oleomargarine, potato salad, canned shrimp, canned crabmeat, and in non-standardized sauces and dressings were published in the January 5 and April 4, 1961, issues of the FEDERAL REGISTER. Regulations on other products mentioned have not been obtained.

FOR FURTHER INFORMATION and samples write Technical Service and Development, THE DOW CHEMICAL COMPANY, Midland, Michigan, Department 851KE7.

THE DOW CHEMICAL COMPANY DOW Midland, Michigan

Broad probes, new procedures at Justice Dept. point to . . .

Sharp Look at . . . Industry Prices . . . Penalties for 'Fixers'

ANTITRUST BOSS LOEVINGER tells FE editor: "We must make laws against price-fixing more self-enforcing. More suits that hit the pocketbook will accelerate respect for the law."

TOUGHER ANTITRUST ENFORCEMENT—with greater stress on price fixing—will give the Justice Dept. a stronger off-stage role in food company operations. And emphasis on criminal sanctions will bring the problem closer to home as far as corporate officials are concerned.

To get a tack on the Justice Dept.'s future course, FOOD Engineering editors last month interviewed Asst. Atty. Gen. Lee Loevinger, new Antitrust Div. boss who has strong beliefs on what can be done to strengthen the Sherman and Clayton Acts. Based upon what was said at that meeting, plus related developments in Washington, food chiefs can look for:

► More government probing into the industry's pricing techniques.

► Stronger likelihood of jail sentences and fines for individual violators of antitrust laws.

► Changes in Justice Dept. procedures making it easier for small business victims to sue for triple damages.

► New look at the industry's stepped up urge-to-merge.

Justice Dept. presently has some 50 pricing probes (in over 40 cities) covering such staples as meat, dairy, and bakery items, among others. Loevinger says the investigations are needed "to find out what is going on and whether new policies or laws are needed." Some interpret this to mean that Justice may be building a case for new price-fixing laws.

Three indictments (not related to the above probe) have already been trotted out this year. Two focus on Florida bakery firms while a third charges 8 milk companies, and 4 top execs, with

THAYER C. TAYLOR Associate Editor, "Food Engineering"

fixing prices and rigging bids in sales to Baltimore city and county schools.

As part of its sweeping investigations in this area, Washington sources believe, the department will pay more heed to the "price leadership" theory. This argument, briefly, holds that in an industry dominated by a few companies there is always a leader whose moves to raise or lower prices are faithfully followed by the other firms. As a result, critics contend, you have the same lack of competition as if the companies got together and formally agreed to set prices.

H. Graham Morison, former asst. atty. gen., warned a recent American Management Assn. briefing session on government regulations that the Kennedy Administration may tackle this problem by:

...1) Expanding the scope of antitrust laws through judicial action. Antitrust law is largely judge-made, Morison observes.

... 2) Expanding coverage of the Sherman Act's section 2 (which bans monopolizing, and attempts, agreements, or conspiracies "to monopolize").

Significantly, Sen. Kefauver plans bills along this line. One of them, reportedly, would make identical bids grounds for legal presumption that collusive price fixing existed, thus shift the burden of proof from government to the accused.

Fashionable Prison Garb

Loevinger wants the antitrust laws to be more "self-enforcing." Two ways for accelerating this, he has indicated, are more frequent application of jail terms and more aid for small-business victims of predatory price fixing or monopolies. While he points out that "not every violation calls for a jail sentence," he quickly adds that such sanctions are appropriate where there is "conscious and deliberate violation." And such violations, he adds, "are a serious offense . . . as immoral as any other act that injures the many to profit the few. Those who are apprehended in such acts are, and will be treated as, criminals and will personally be subjected to as severe a punishment as we can persuade the courts to impose."

Of course, jail sentences are not entirely novel. In the '57 Safeway Stores case, for example, the president and general manager of the chain received 1-yr. probated jail terms as well as $75,000 and $5,000 fines, respectively. And, last year, 4 officials of the Los Angeles Meat & Provision Drivers local of the Teamsters Union received 3-yr. probated sentences and $1,000 fines for Sherman Act violations.

However, public talks by Justice officials strongly suggest greater recourse to criminal sanctions of the Sherman Act—actual jail terms rather than suspended sentences. In this connection, it is worth noting that Robinson-Patman's Section 3 (enforced by Justice Dept.) also provides for 1-yr. jail terms.

That the antitrust laws should help small business is another Loevinger credo. As he states, "the victim gets no direct aid even if we win a big suit."

He concedes that changes in department procedures in consent decrees have been explored. He does note that "if victims of antitrust brought more suits for triple damages, the pocketbook effect would make potential violators hesitate." Here, industry sources stress the fact that Loevinger's background includes considerable experience representing injured parties in antitrust cases.

In the past, defendants in Justice Dept. suits have favored con-

Antitrust Chief Lee Loevinger

Q. Many food companies are expanding into overseas markets, often by acquisition. Do our laws have anything to say on this?

A. Antitrust laws cover foreign operations where they affect domestic industry. Say, as an example, that six food manufacturers were selling to an important chain store group in London. If one of the American firms bought this chain and then prevented the other five manufacturers from selling their products to that chain, that could be a violation of our laws. We would certainly take an interest in it.

Q. Why does the Justice Dept. want a law requiring pre-merger notification when it already has the power to file suits against pending acquisitions?

A. It would put all companies on equal footing. True, some companies tell us they plan a merger and ask for our opinion. But many others don't. Our people waste a lot of time reading newspapers, business and financial journals, and other sources in order to learn what mergers are being planned or have already taken place. If we have advance notice, we're in a better position to get the facts we need to decide whether or not we should investigate further or act. Advance notice can help the companies, too. Merger suits can be expensive, and a company is better off if it knows beforehand that the government will or will not oppose a planned acquisition.

Q. Is it true that you believe in jail terms for price fixers?

A. Not every violation calls for a jail sentence. But where the individual is guilty of a conscious and deliberate effort to violate the antitrust statutes he should be made to serve a sentence in accordance with the criminal sanctions imposed by the law. Of course, the important thing here is to determine the difference between individual and corporate responsibility. Conscious and deliberate violators will be subject to as severe a punishment as we can persuade the courts to impose.

Q. Does the Attorney General's announcement of price-fixing probes in the milk, meat, and bread fields indicate that this practice is considered a serious problem in the food field?

A. That's what we hope to find out. Generally speaking, price fixing in foods, where it occurs, is most likely to be of limited geographical extent as in the case of the bakers in the Jacksonville area. However, we are investigating to see if new prosecutions, laws, or policies are needed.

Q. Can you elaborate on your belief that more private suits by small business would help antitrust enforcement?

A. Even if Justice Dept. wins an antitrust suit, the victim of price fixing gets no direct aid. Because the victim can sue for triple damages, private suits along this line would make potential violators more respectful of the law. Our need is to make the law more self-enforcing; private

Gives Views on Key Issues . . .

suits that hit the pocketbook can often be more effective in this respect than government action. However, the Justice Dept. can help private parties only to the extent of providing the information that is on the record. It wouldn't be fair for the small businessman to assume that the Dept. would try his case for him.

Q. What are the guide lines used to approve or oppose a contemplated merger?

A. Each case has its own factors. Competitive effect has to be weighed. Thus, a merger between two small companies, which may result in better competition, could be looked upon more favorably than when two big companies combine to bring about a situation tending to monopoly. Other considerations include comparison of the size of the largest firms in the field to those being merged, the prior relationship between the two companies, the resultant size of the merged firms compared to the field in which they operate, whether the new combination dries up the source of supply for competing firms.

Q. Would you comment on the Federal Trade Commission's effort to get access to business data Census Bureau receives from industry?

A. We'd like to get certain industry information, too, although we do not expect confidential information regarding individual companies. It would be very helpful to us in those industries, such as food, where you have a tremendous number of competitors. Information-getting isn't such a problem in basic industries like steel where it is comparatively easier to compute market shares. Nor do I think businessmen will be less inclined to cooperate with the Census Bureau if the FTC wins its case. Practically every information-gathering task Census carries out has been started at the request of business who realized that there was no other way of getting the necessary information.

Q. FTC Chairman Dixon has declared that the commission "will be alert to the goals and desires of the White House and the Congress." Would this kind of "direction" be said to characterize the Justice Dept.'s future course, too?

A. Our powers are based on the law, as passed by the Congress. If a specific abuse is widespread, naturally you will expect close cooperation between different agencies. But we can act only pursuant to law. My oath of office is to the laws and Constitution of the United States.

Q. Has the Dept. taken any special notice of the merger activity in the food chain store field?

A. Mergers there seem to be exploding all over the lot—chains buying each other, buying up drug stores and discount houses. It could be that this is an area where some investigations are needed.

sent decrees (in civil suits) or pleas of nolo contendere (in criminal cases) because such settlements, by keeping evidence from the public record, protect them from triple damage suits. Congressional critics say that the Justice Dept. has been too quick to accept such arrangements.

In the food industry alone, according to an FE check, practically all of the suits completed by the department between '55 and '60 followed this path. Out of 25 case dispositions, 11 were settled by consent decrees, 10 by government's acceptance of pleas of nolo contendere.

One change Loevinger reportedly favors is to make such decrees public before they are signed, thus give interested parties a chance to have their say. A step in this direction was taken in the recent asphalt price fixing case (by the previous administration) when the government accepted a nolo contendere plea but insisted that the final order carry a section making the defendants liable for triple damages. **This still falls short of critics' objections because it applies only to governmental bodies, not to private parties.** More recently, Sen. Humphrey filed a bill to require the government to publish proposed consent decrees in the Federal Register 30 days before they are to take effect, thus giving outsiders a chance to state views.

Corporate Wedlock Preview

With industrial mergers again on the upswing, Loevinger wants new tools for the Justice Dept. One such aid he seeks is compulsory pre-merger notice, where combined assets of the acquired and acquiring companies would exceed $10 million.

In the past, the government has shown more-than-average interest in food industry mergers. For example, a National Industrial Conference Board economic analysis shows that of 57 anti-merger suits brought under Section 7 of the Clayton Act, over one-fourth (or 16 cases) touched on the food industry. However, six were started by the Justice Dept., ten by Federal Trade Commission.

An FE study indicates that food mergers may set new records this year. According to FTC, there were 53 food industry mergers in '56, 32 in '58, 55 in '59, and 52 in '60. **However, a running check kept by FE shows that at least 48 mergers took place this year up to June 10—indicating that the '59 high will be easily topped.**

For the most part, these mergers are between companies operating in the same branch of the food industry. But at least 12 of them may be said to represent attempts to diversify—where the acquiring company seeks to broaden its product line to appeal to a wider range of consumer tastes (Pet Milk buying C. H. Musselman), or latch onto a fast-growing product area (Campbell Soup absorbing Pepperidge Farms), or get a foothold where technological potentials are promising (Borden taking over Wyler & Co.).

Mergers that aim at diversification are called "conglomerate" types, and their applicability to present antitrust statutes is a thorny problem both in and out of government. The market area they affect is much harder to pin down than in the more traditional horizontal (where manufacturers of the same product combine) and vertical (where a manufacturer and a supplier or retail outlet may join together) types. However, as the conglomerate type becomes more important, Loevinger can be expected to steer Justice Dept. activity in this direction. (End)

Sets Specs for Handling Frozens

All-industry committee recommends practical operating practices for voluntary policing of quality

HOW TO HANDLE frozen foods to protect quality has been spelled out by Frozen Foods All-Industry Coordinating Committee headed by H. C. Diehl.

As part of a 5-year upgrading program, FFAICC also calls for indoctrination of employees at all levels in proper techniques and their importance. The coordinating committee also hopes to encourage development and use of better equipment for keeping frozen foods at proper temperatures from plant to retail display case.

Aimed at boosting consumption above the $3 billion current annual level by pleasing consumers more, operational standards are voluntary. They are realistic, too, as contrasted with the AFDOUS code. FFAICC starts with logical lenience and tightens requirements to achieve its goal in '65—with tolerances, too. Present facilities will not have to be scrapped with impractical haste.

These voluntary standards of practice give the business an opportunity to do its own policing of quality. Therefore, they can forestall state control through legislation to enact the code pushed by Association of Food & Drug Officials of the U. S.

Recommendations are presented here in condensed form.

AFDOUS is standing by its own code. And it is recommending state and local regulations for handling frozen foods.

Endorse Recommendations

These associations endorse the voluntary operating practices recommended by FFAICC:

- American Trucking Associations
- National Association of Food Chains
- National Association of Frozen Food Packers
- National Association of Refrigerated Warehouses
- National Association of Retail Grocers of the United States
- National Fisheries Institute
- National Frozen Food Association
- National Prepared Frozen Food Processors Association

FFAICC Recommendations

PROCESSOR—Where processor has his own freezer and warehouse, product should leave the warehouse at 0 deg. F.

If processor freezes but does not have sufficient warehouse space to complete the freezing, product should leave his plant promptly, at 10F. in an insulated and refrigerated vehicle. Movement to primary warehouse for reduction to 0F. should not take longer than 8 hr. If trip to warehouse is 2 hr., or less, an insulated vehicle should be used.

Product temperature should be reduced to 0F. upon reaching primary warehouse.

WAREHOUSING — Each warehouse should maintain an air temperature of 0F.

Temperatures of each room should be read and recorded each day.

Warehouser should record product temperature of all lots of frozen foods received.

Whenever frozen foods are received at 15F., or higher, the warehouseman should propose special handling to reduce temperature to 0F. as rapidly as possible.

Each lot should be marked for identification.

Movement over dock areas should be prompt to minimize exposure to high temperatures.

During defrosting, food should be effectively protected with cover, or be moved from beneath coils.

Frozen foods going into break-up room for assembly of orders must be promptly moved out unless room is at 0F.

TRANSPORTATION EQUIPMENT—Vehicles should be refrigerated to:

Years	Temperature
'61 through '62	0F., tolerance to 15F.
'63 through '64	0F., tolerance to 10F.
by '65	0F., tolerance to 5F.

Device should indicate air temperature inside vehicles.

Route delivery trucks should comply with provisions for vehicles of transportation and be equipped with curtains or flaps in the doorway area, or with port doors.

Over-road equipment purchased after March 1, '61, should maintain product at 5F.; route trucks, at 15F.

OVER-ROAD TRANSPORTATION—Vehicles should be precooled to 20F.

Frozen foods should be securely packaged.

Frozen food should not be tendered to, nor accepted by, a carrier if its temperature exceeds 0F.

Frozen foods should be loaded so as to provide for flow of refrigerated air at the front, rear, top, bottom, and sides of load, except for vehicles of envelope type construction.

Product should be loaded promptly so that temperature rise does not exceed 10F. in '61-'62; 5F. in '63-'64; 0F. by '65.

A period of 2½ hr. should be allowed for loading vehicles purchased after March 1, '61, and all vehicles in use by '65. A tolerance of 2F. should be allowed for each additional hour required in loading.

Product temperature during movement in an over-the-road vehicle should not exceed 15F. in '61-'62; 10F. in '63-'64; 5F. by '65. In multiple pick-up or delivery, 5F. tolerance should be allowed.

ROUTE DELIVERY—In addition to above, these provisions should be met:

Each lot for individual consignment should be refrigerated to:

Years	Temperature
'61 through '62	15F., tolerance of 5F.—for period not to exceed 6 hr.
'63 through '64	15F., tolerance of 5F.—not to exceed 3 hr.
by '65	10F., tolerance of 5F.—not to exceed 3 hr.

Devices should be precooled to 20F. before being loaded.

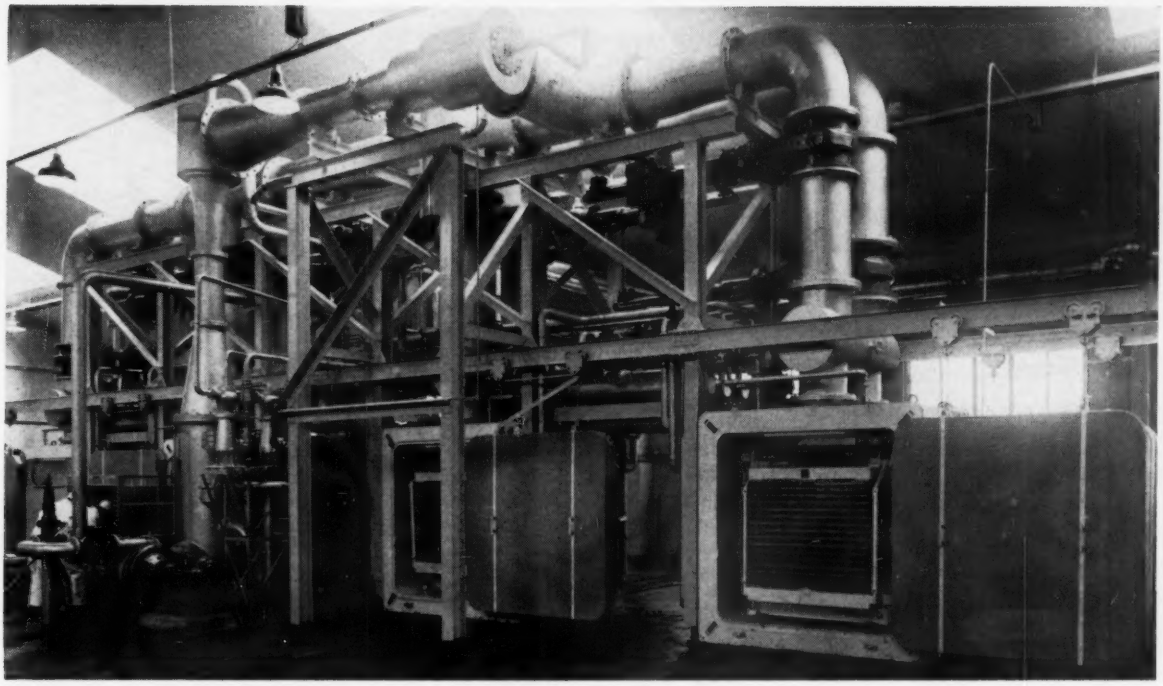
RETAIL STORAGE FACILITIES—Frozen food storage facilities should maintain 10F. in '61-'62; 5F. in '63-'64, and 0F. by '65.

DISPLAY CASES — Display cases should maintain air temperature of 10F. in '61-'62; 5F. in '63-'64; and 0F. by '65.

RETAIL HANDLING—Frozen foods should not be accepted by a retailer when temperature exceeds 10F. in '61-'62; 5F. in '63-'64, and 0F. by '65.

All frozen foods should promptly be placed in frozen food storage or in display cases, but not above product load line.

Retail outlets should be equipped with frozen food storage facilities. They should employ first-in first-out inventory control.



ACCELERATED FREEZE-DRYING plant installed by Irish Sugar Co. can process 12 tons of beef, or 30,000 chickens, in three 8-hr. shifts. Facility cost $700,000.

Freeze-Dries for World Market

Shipping economy seen offsetting process cost as Irish firm puts $700,000 plant into production on meats, fish, vegetables, fruits

IRELAND is counting on freeze-drying to tap world markets for her agricultural products and bring new prosperity to her economy.

A full-scale commercial freeze-drying plant has just been put into operation by Irish Sugar Co. at Mallow, Eire. This $700,000 factory will dry beef, pork, mutton, chicken, turkeys, fish, vegetables, and soft fruits. It is using accelerated freeze-drying developed by Vickers-Armstrong, Ltd., London. On three 8-hr. shifts, the plant can process 12 tons of beef a day, or 30,000 chickens, for example.

Expectations are to develop a $140 million annual export business in ten years. Irish Sugar anticipates a capital investment of at least $11.2 million over this period to increase plant capacity. There are 200 workers in the plant, and management expects the number to double by '62.

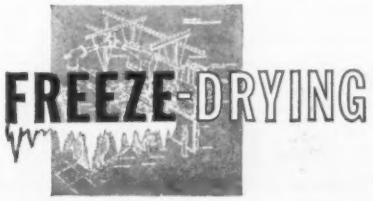
Biggest markets are considered to be England, the United States, and Africa. Economy in shipping is expected to compensate for relatively high processing cost.

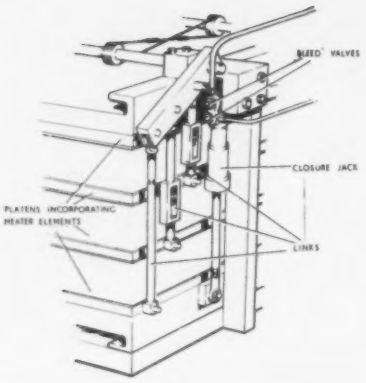
This is no sudden venture. Irish Sugar processed some 600 different items in its pilot plant at Mallow during the past year. The firm has worked in close cooperation with the British Ministry of Food, which conducted extensive freeze-drying research at Aberdeen. Work toward final development of accelerated freeze-drying began in 1945.

Key Technical Factors

Significant technical factors involved in freeze-drying are concisely pointed up by research technologists of Vickers-Armstrong.

Once food is frozen, it is virtually dry since no liquid phase is present. If the ice is then removed by sublimation, the structure and spatial distribution of salts and other components in the dried food are the same as in the original frozen food. The effects of migration are eliminated. Vapor cannot carry salts away from the ice surface nor can it produce shrinkage of tissues. (turn page)





PLATES SQUEEZE together for contact that speeds heat-transfer and cuts drying time. Hydraulic jack applies force.

Experience has shown that most foods freeze-dry satisfactorily in the range −15 to −20C. (5 to −4F.). If the design figure is taken as −17C. (1F.), which corresponds to an ice vapor pressure of 1.03 mm. Hg, a suitable maximum total pressure in the system is 1 mm. Hg absolute.

Using the latest methods of applying heat of sublimation to the food, a maximum load of about 1 lb. of water vapor/hr./ sq. ft. of tray area must be extracted or condensed. This must be done at a partial vapor pressure of approximately 0.9 mm. Hg. Considering that 1 lb. of vapor at this pressure occupies a volume of about 18,000 cu. ft., a high-capacity vapor removal system is necessary. Consider a typical single cabinet unit with a tray area of 350 sq. ft. carrying 900 lb. of food. This would require a system capable of handling 350 lb. of vapor/hr., or about 100,000 cu. ft./min. at the design pressure.

Multi-stage steam ejector systems are a reliable means for removing this large volume of vapor. These have few moving parts and require little maintenance. Relatively large quantities of steam and condensing water are required, however, to operate them.

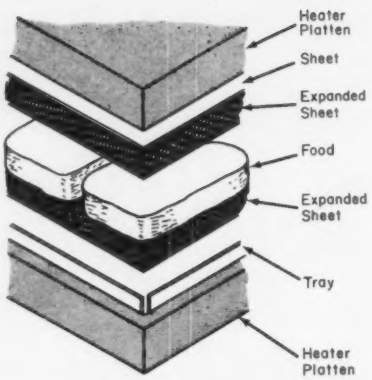
Refrigerated condensing systems have high capital costs, are complex, require considerable maintenance, and the evaporator coils have to be defrosted between drying cycles. But operating costs are likely to be less than for steam ejectors.

The choice between the two systems depends largely on local conditions. Availability of steam and water, ambient temperature, and power supply costs are factors.

Application of Heat

Heat must be supplied to the food at a rate of about 1200 Btu./ lb. of ice sublimed. Although cost of this quantity of heat is small, difficulties encountered in transferring it efficiently to the ice in the food are considerable.

Sublimation depends on the rate at which heat is supplied and on resistance to the flow of water vapor away from the ice. As drying proceeds, the ice surface recedes away from the food surface. Thus, a layer of dry food of increasing thickness and low conductivity intervenes. At the same time, resistance to flow of vapor through the dry layer becomes greater.



VAPOR ESCAPES readily through expanded metal mesh separating heating plates from food. This accelerates freeze-drying in Vickers-Armstrong method.

It is evident that the highest sublimation rate can be achieved by applying maximum heat to the food when resistances to both heat transfer and vapor flow are least —i.e., at the start of drying.

This is achieved by a special technique. It provides an effective compromise between close thermal contact and freedom for the escape of vapor. "Accelerated freeze-drying" is based on this technique.

Accelerated Freeze-Drying

In this process, the heating assembly consists of a stack of parallel heating plates between which the frozen food is loaded on trays. These plates can be moved together for close, even thermal contact with lower and upper surfaces of each layer of food. Plate movement is actuated by four hydraulic jacks that can apply 8 psi.

A heating plate is hollow, and contains two labyrinthed counterflow circuits through which hot water is pumped. The water is heated by steam in a heat exchanger to a maximum of 140C. (284F.).

Each layer of frozen food of constant thickness is sandwiched between sheets of expanded metal mesh. These are inserted between both tray and lid and the food surfaces. Even when pressure is applied to the food, there is an adequate path through the mesh to allow vapor to escape.

Application of pressure insures sufficient heat transfer. Since the corners of the mesh are slightly pointed, some degree of penetration into the food is obtained.

Foods Suitable for Accelerated Freeze-Drying

Animal and Fish Products

Beef—Raw steaks, raw minced, sliced cooked, raw cubes.
Chicken—Cooked flaked.
Pork—Raw steaks, raw chops, minced cooked, chunks cooked.
Veal—Minced cooked.
Ham—Minced cooked.
Egg—Raw, yolk and white beaten together; raw, yolk and white separated.
Cod—Raw steaks with bone, or boneless; flaked cooked.
Halibut—Raw steaks.
Salmon—Raw steaks.
Herring roe—Raw.
Scampi—Raw; poached.

Vegetables

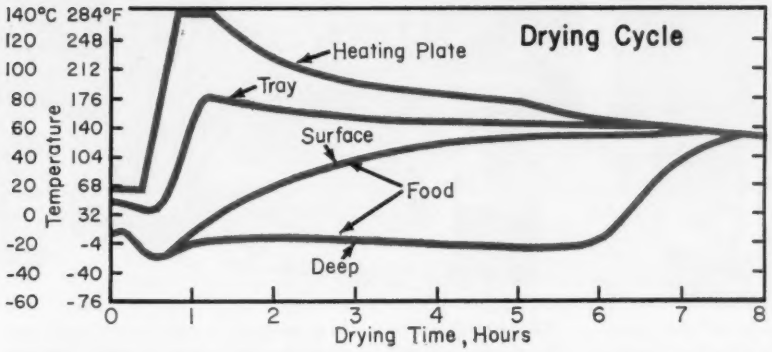
Potatoes—Scalded, chipped, sliced.
Carrots—Scalded, sliced, diced, stripped.
Cabbage—Scalded, shredded.
Peas—Scalded.
Beans, broad—Scalded.
Beans, green—Scalded, crosscut.
Cauliflower—Scalded.
Beetroot—Cooked, sliced.
Asparagus—Scalded.
Onions—Raw, sliced.
Leeks—Raw, chopped.
Mushrooms—Raw.
Mixed vegetables—Raw.

Fruits

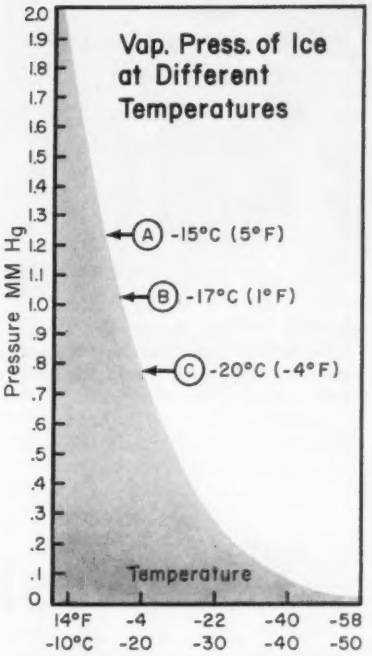
Apples—Raw, diced or sliced.
Apricots—Raw, halved.
Bananas—Raw, sliced.
Black currants—Raw, abraded after prefreezing.
Greengages—Raw, halved.
Plums—Raw, halved.
Raspberries—Raw, whole.
Strawberries—Raw, husked and halved.
Fruit juices—Prefrozen slabs.
Fruit pulps—Prefrozen slabs.

Cooked Dishes

Meat and vegetable stew.
Spaghetti and tomato sauce.
Sago pudding.
Rice pudding.
All are frozen and cut into slabs before drying.



DRYING TIME IS 8 HR. (av.) in accelerated process. Curves relate heating, tray, and food temperatures to time.


Vap. Press. of Ice at Different Temperatures
Pressure MM Hg
2.0 1.9 1.8 1.7 1.6 1.5 1.4 1.3 1.2 1.1 1.0 .9 .8 .7 .6 .5 .4 .3 .2 .1 0
A -15°C (5°F)
B -17°C (1°F)
C -20°C (-4°F)
Temperature
14°F -4 -22 -40 -58
-10°C -20 -30 -40 -50

VAPOR PRESSURE of ice in food declines sharply at low temperatures. Most foods require 5F. to —4F. range.

This increases the thermal contact and shortens the heat path to the ice surface in the food. Amount of plate pressure applied depends on the load-bearing properties of the food.

Drying Cycle

Assuming that a single-cabinet unit is operated with a four-stage steam ejector vacuum system, a typical drying cycle would be as follows:

The food is spread on trays in even layers about ⅝ in. thick using expanded metal inserts. The trays are loaded into a rack which is then placed in an air-blast freezing unit. When the food is frozen to about —20C. (—4F.), the rack is removed from the freezer and wheeled to the cabinet. The trayloads of food are loaded into the cabinet with the heating plates in the open position.

Initial rapid evacuation of air from the cabinet to avoid thawing is effected by high-capacity booster ejectors. These reduce the absolute pressure in the system to 20 mm. Hg in about 3 min. Primary and secondary boosters then pull the pressure below 1 mm. Hg. Pump-down takes about 5 min. After the boosters are shut off, the "leakage" air load is handled by low-capacity ejectors.

When cabinet pressure is less than the vapor pressure of the ice, sublimation begins. Now the food temperature falls rapidly to a minimum of about —30C. (—22F.). The heating plates are then closed into tight contact with the food, and steam is applied to raise the temperature of the plates from about 15C. (5F.) to 140C. (284F.) in 15 min. The plates are held at this temperature for about 30 min.

Subsequent natural cooling of the circulating water causes the temperature of the plates to fall comparatively slowly. The cooling rate is adjusted, if required, by applying small quantities of heating steam throughout the rest of the cycle. At the end of drying, the temperature of the plates will have fallen to 60C. (140F.).

This cooling procedure avoids heat damage to the dry food surfaces as the sublimation rate falls. The temperature of the food surfaces is not allowed to rise above 60C. (140F.).

If necessary, heating plates can be cooled rapidly by using a heat exchanger or by injecting cold water directly into the heating circuit.

During drying, the plates are gradually brought into closer thermal contact with the food by increasing the plate pressure in increments. Drying is then completed when the food is at the same temperature as the heating plates.

Food temperatures are measured by thin flexible thermocouples inserted in the food before it is frozen. The total drying time depends on type of food and thickness, but an average is 8 hr.

When drying is complete, the cabinet vacuum is broken by admitting dry nitrogen. Then the doors are opened and the food unloaded into a rack.

As soon as possible after drying, the product is packaged or canned in dry nitrogen or carbon dioxide. This should be done in an air conditioned room at low relative humidity. The product has a final moisture content of about 2% and would absorb moisture from a damp atmosphere.

The package should exclude moisture and oxygen and be opaque to prevent fading of color. It is advisable to pack reasonably tightly to avoid fragmentation due to movement of the dry product inside the can.

Heating by Radiation

An alternate method of transferring heat to the food is by long-wave infrared radiation. In a batch freeze-drying unit using radiant heating, the plate assembly is static. So the complex plate closure mechanism of contact heating is eliminated.

The food is placed between the plates on open-mesh trays. This allows radiant heating on both top and bottom food surfaces.

The heating plate surfaces are blackened or otherwise treated to increase emissivity, and either fluid or electrical heating can be used. The plate temperature cycle is very similar to that used in contact heating. Since the food surfaces are virtually open to the system, vapor escape presents no problem.

Freeze-drying using radiant heat is being actively investigated. Indications are that drying times are longer and overheating is liable to occur. (End)

GETTING THERE: As retailers drive to build stronger customer loyalty, they have been forced to upgrade the quality of their private label packaging, as this representative selection shows.

STILL BETTER: Most packaging innovations—as with new products—are still sparked by advertised brands. One reason is greater reliance on market research, professional design work.

The Missing Person in the Battle of Brands

Keep the consumer happy and you'll have less to worry about from private labels. Noted package designers pinpoint four areas where food makers can strengthen their position

HOTLY debated battle of private labels vs. national manufacturers' brands is beginning to look a little like the duelists who shot each other and left the lady in question without a suitor.

The lady, of course, is the customer. Everyone says they think only of her—but do they? In this internal brand competition, both the retailers and the manufacturers risk becoming so involved with the marketing complexities and paradoxes that they overlook one very basic psychological fact:

Consumers have been very carefully nurtured over the past 30 years to expect the excitement of new products and a wide choice of available items.

Thus, the giant retailer who leans too heavily in favor of his own labels, and refuses to stock enough national brands, is going to eventually drive customers away in search of the products they have seen advertised.

The national brander, on the other hand, who "joins" the PL battle by producing retailers' brands—and neglects his role as product innovator—is going to find himself standing still, and eventually sliding backwards.

This is, by way of illustration, an over simplification of a very complicated subject. No retailer, now or in the future, is going to stop stocking national brands; and any smart manufacturer is not going to close up the new product shop in his business.

However, danger signals are flashing. One surety: The PL is not fad, fiction, or fantasy. It is a fact—one that has been with us since the Depression, and one that shows no sign of disappearing. **Although an overall statistic is hard to come by, J. O. Peckham, of A. C. Nielsen Co., estimates that PLs now account for 8 to 10% of the total grocery business.**

A total figure, even if accurately pinpointed, is misleading without noting the trend to giantism in the retail field. A Nielsen report shows that chains and large independent supermarkets accounted for 69% of the total food store dollar volume in 1960, compared to 44% in 1948. Since these chains are the headquarters for PLs (with the giants, Kroger, Safeway, American, Colonial, and A&P, doing from 10 to 25% in PL sales), the manufacturer faces a vital market where a sizable potential is gone.

Most Desirable: Copy Catters

Even when brushed in with statistics, the picture does not become clear until you examine the product categories where PLs are strongest. They are the products—such as coffee, canned vegetables and fruits, and frozen foods—which offer the retailer fast turnover and require little or no product development on his own. They do not pretend to offer anything new to the customer. They are carbon copies, and in some

J. GORDON LIPPINCOTT and WALTER P. MARGULIES
Chairman and President, Lippincott & Margulies, N.Y.C.

cases, the very same product the national manufacturer sells under his own name.

Their appeal to the retailer is mainly financial and strategic. Dollar-wise, the PL offers him a better profit margin. For instance, one chain's controlled brands are said to represent 14% of its grocery sales—but more than half of the company's total net.

Strategically, the PL gives the retailer a chance to develop repeat customers by providing an exclusive product. If people want it, they must come to his stores to get it. And if they come to him for one product, he reasons, chances are he will get the lion's share of their total food dollar.

As designers and marketing consultants with many years' experience in packaging, market research, and store interior designs, we feel that both of these premises are faulty, from a long-range marketing view.

To justify this opinion, let's return to our "missing person"—the lady with the go cart. Certainly, a lower price on an item is an incentive; but it is not enough today to convince her that an inferior-looking product is worth the savings.

Retailers, increasingly aware of this fact, are upgrading their lines . . . and herein lies the biggest paradox in the brand debate. **As they upgrade their packages, and invest in local advertisements, retailers begin to lose their trump card: Price difference.**

There are other hidden costs in PLs. Warehousing, and capital tied up in inventory, to name two. Another is the monies spent on testing PLs produced by national manufacturers, who may not watch quality control as carefully as they do on products sold under their own name.

All of these factors dip into the profit pudding . . . and, after all is said and done, the retailer still does not have an original or exciting product because he is not equipped and cannot afford product development and market research.

Cheapies Won't Do It

It's true that the big chains and supermarkets should build their own storage image. But stocking the shelves full of inferior looking packages is not the way to do it.

Instead, the answer lies in upgrading store decor. In our design for a new Kroger supermarket, for example, we created a series of department "shoplets" for the bakery, produce, meat, gourmet foods, tea and coffee sections, etc. Emphasis was on mood lighting, accessories reminiscent of the specialty shops of yesteryear, Gay Nineties signage, and use of quality materials in construction.

The result: A store that makes shopping pleasant, and builds loyalty among its customers.

In sum, the consumer's mood for new products, gourmet foods, and convenience foods, with built-in maid service, and sold in pleasant surroundings, is the real power behind the private label vs. national brands tug-of-war.

To quote Mr. Peckham again, he says the private label becomes a real threat only when the retailer steps into the role of product innovator. As an example, he cites the edge A&P got on major meat producers when the chain developed the tray-pack bacon package, which makes it easier to get a few slices of bacon out of the package. As a corollary, witness the success stories of national brands such as Sara Lee, which made strong headway into new markets despite the fact that they far outpriced their nearest competitors.

Naturally, it's easy to quote successes, because the 4 out of 5 new products that don't make the grade quickly fade away. **Besides developing new products, there are 4 other key areas the manufacturer has within his control to improve the chances of his products ending up alive on the supermarket shelf.** To wit:

► **1. Improving retailer relations:** Today, when the acceptance of the manufacturer's products has to stand up under the scrutiny of buying committees, it takes more than just a salesman knocking at the door. Companies with trade relations departments and dealer relation programs, staffed by top executives, find that being of service to the retailer pays off. Retailers should be told what the company's advertising plans are—and how this backing will help them on a local level. They should be fully advised about the product, the research that went behind it, and how it will help to build sales.

► **2. Cost control:** The long, hard road a new product has to travel is dotted with toll bridges, and many end the journey with too high a price tag for the consumer. High prices, and a low profit margin for the retailer, are fertile breeding grounds for PLs. In spite of the few million words that have been written about Advance Planning, you still see an amazing lack of coordination among the departments involved in getting a new product off to market.

All Together, Mates

We are proponents of what we call "Systems Marketing." This means simply an overall consideration of the product as one complete unit with manufacturing, market research, product development, packaging, distribution, and advertising all working towards one common goal, established long before one nickel has gone into the product.

► **3. Packaging:** If the product has to wear a slightly higher price tag than its PL competitor, then it must look the difference. Cinderella, in spite of goodly qualities, didn't win the prince sitting by the hearth in a drab costume.

It is unusual, however, to isolate a packaging success story, because the container is just one element in the spectrum, though a very important one.

► **4. Advertising:** In the main, advertisers take three main approaches:

A. The Campbell approach which links all the company's soups under one name.

B. The P&G approach which promotes each product separately with a connection to the parent company only at the launching.

C. The Kraft Foods approach which puts great emphasis on brand for some items and limits the name to small type for endorsement only on other packages.

Each of these methods has merit, but there is a growing trend to put more emphasis on the corporate name and to consolidate advertising. This same trend applies to packaging, to give a "family look" to the line, and to increase its shelf power. This umbrella approach is one that the private labelers find effective for their local advertising.

These are basic, long standing tactics. Yet case histories of "Product Failures" show that manufacturers don't always keep these factors in balance. These factors will become increasingly important in the next decade as the marketplace itself becomes the property of the big chains and supermarkets. (End)

VARIETY of products may be flavored via pecan butter, including these bakery items. It's also satisfactory for milk shakes, ice cream, and some candy products.

Develop New Flavor Ingredient

Processed pecan "butter" provides concentrated flavor for a wide variety of foods. Here's product's characteristics, formulation, and potential uses

YOUR NEXT flavoring ingredient? It could be a new product development called "pecan butter."

Kitchen and pilot plant tests indicate it's a highly satisfactory flavor additive for confections (fudge and pralines), milk shakes, ice cream, dessert sauces, a "foam" product (whipped with milk and honey), prepared cake mixes, and baked goods (cakes, cookies, icings, chiffon pies and sweet dough breads).

New product experienced an initial setback when originally tried as a sandwich spread. Its flavor was too "strong." But this "concentrated" strength prompted our laboratory to test it as a food flavor. As a result, we've found it to be an excellent ingredient for some food combinations when added in amounts not exceeding 15%.

Development was encouraged by a leading manufacturer of pecan products, which sells some 50 pecan items in its 75 retail roadside outlets and 300-odd army post exchanges. Firm's intention is to feature pecan butter-flavored milk shakes in snack bars. In addition, a drugstore chain is attempting to arrange distribution of the new product through its fountain services.

Indications are that processing pecan nuts into a "butter" is the ultimate step in the production of a "flavor concentrate" stable and suitable for long-distance shipments. And, judging from more recent tests, pecan butter should carry this nut's flavor into new and still undeveloped food products.

In general, toasted nuts should be used for pecan butter flavoring of baked goods, confections, and milk products. However, tests should be run ahead of time to learn if certain products (baked goods, too) should use raw or toasted nuts.

High fat content of the butter means it will replace 75% of the fat added to baked goods and 25% of the fat in ice cream. It is not suitable in fatless products such as sherbet or divinity.

High Oil Content

Significant is the nature of pecan butter's fat. Product is high in unsaturated oils (about 95%), comprising oleic acid (70%) and linoleic acid (25%). As a result, it is rated as one of the highest known sources of unsaturated natural oils.

Cost-wise, pecan butter runs more than peanut butter. However, when used to extend its flavor into other products (whether produced commercially or in the kitchen), amount required is about one-fourth that of peanut butter.

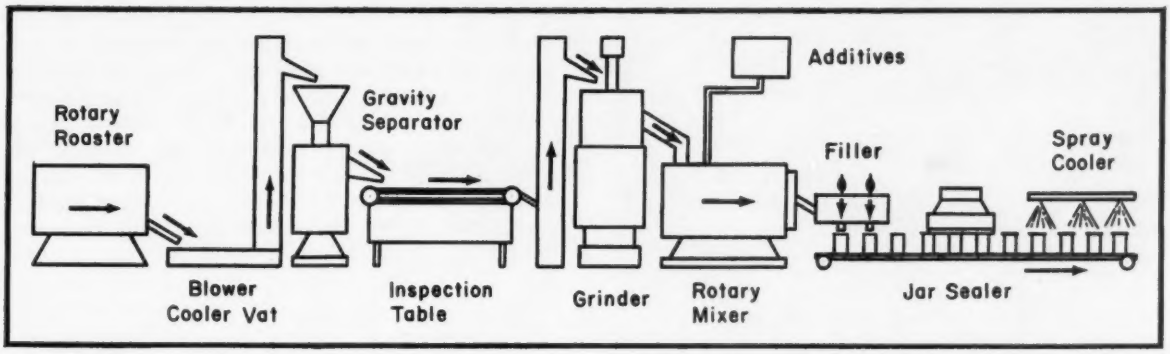
In addition to flavor richness, product is high in nutrients, containing about 73% fat, 13% carbohydrates, 10% protein, 1% ash, and 3% water. Energy value is about 3,650 calories/lb. Pecan butter also has a smooth creamy consistency and texture, uniform light brown color, aroma of freshly toasted pecans, and a pronounced, slightly astringent flavor. Average peroxide value is 0.69 millimols of 0_2 per kg. of oil and free fatty acid value is 0.54% (as oleic).

High oil content makes rancidity and staleness major problems. And the oil separates rapidly and noticeably. However, these adverse conditions are easily controlled with the addition of small amounts of an antioxidant to curb rancidity and hydrogenated fat to check oil separation.

Suggested as antioxidants are 0.01 portions of BHA (butylated hydroxyanisole), ascorbyl palmitate, or NDGA (nordihydroguyaretic acid). Though preventing oil separation, hydrogenated fat produces pecan butters with textures influenced by additive's melting point. Examples are the firm and slightly tough-textured "butter" produced with high temperature-melting hydrogenated fat (145F.) and the smooth and creamy texture resulting from low-melting fat (120F.).

Product holds up well if suitably processed and packaged. When kept in unopened jars at 36-40F., fresh flavor is retained for nine months. Opened jars should be kept under refrigeration or consumed within two to three weeks. If opened and held at room tem-

E. K. HEATON and J. G. WOODROOF
Georgia Experiment Station, Experiment, Ga.



PECAN BUTTER processing closely resembles that of its sister product, peanut butter. Nuts must be shelled, dried, and graded before entering roaster. Care must be taken to prevent rancidity by sealing jar airtight.

perature, product will become stale and rancid in about four weeks.

For Better Flavor

Pecan butter's flavor, texture and appearance can be improved by the addition of small amounts of dry ingredients such as dextrose, corn starch, corn flour, confectioners' sugar or oat flour. However, any of these "drys" shouldn't exceed 2½%. Higher amounts around 5% would tend to make the butter pale in color, stiffer in texture, and less flavorful. These additives may also give the product a greasy appearance by making them oil-off without excessive separation. Preferred is a dextrose that adds sheen to the butter.

High water ingredients such as corn syrup, cane syrup and honey detract from the product's quality. Added in 2½% amounts, they give the butter a coarsely ground, darker appearance, and slightly accelerated oil separation. Higher amounts (over 5%) thicken the product and make nut grinding difficult. Too, heat generated during grinding results in charring. Even mixing these ingredients to the product (after it's ground) doesn't help. Product color darkens, texture becomes gummy, and flavor and aroma are blander.

We also learned that pecans are high in naturally occurring emulsifiers. Consequently, pecan butter mixes easily and remains suspended well in milk and ice cream mix.

Product consistency and texture are determined to some extent by the firmness of grinding. Finely ground butter (98% of the particles small enough to pass through a 200-mesh screen) was fluid enough to pour and required 2½% hydrogenated fat to prevent oil separation. Coarsely ground butter (95% passing through a 50-mesh screen) was stiff and slightly pasty, requiring 1½% hydrogenated fat.

Pecan butter can be produced in plants making peanut butter or candy, shelling pecans—or in specially designed facilities. Initially required is the regular equipment needed to shell, dry, grade, toast, and cool the hand picked pecans. Additional equipment is similar to that used for making peanut butter. This includes burr or stone-type mills (for smooth grinding), a rotary mixer or controlled-temperature steam or electrically heated kettle (for ingredient blending), a filler, jar sealer, and labeler. (See processing flow diagram.)

How It's Made

Typical formula for producing pecan butter requires meats (100 lb.) toasted at 375F. for 12 min. Added are quantities of:

Salt, powdered	1 lb.
Hydrogenated fat	2½ lb.
Dextrose	2½ lb.
Antioxidant (BHA)	0.01 oz.

Ingredients are ground to a smooth, fine texture to yield approximately 210 jars (8-oz.).

Important is careful selection of the most desirable pecans. Repeated tests point to the use of plump, bright-colored nuts that are well filled and noticeably fresh in aroma and flavor. Pecans lacking these qualities produce an inferior grade butter. Excellent butter can be made not only from individual varieties of nuts but also by blending several varieties and by using pecan halves or pieces of all sizes.

Texture and consistency are influenced by the nut variety, its oil content, degree to which it is filled, and firmness of the grind. Nuts with a high fat content (Schley variety) produce a thin product. Medium-oils (Stuart) yield a butter of medium consistency. And low-oil pecans (Moneymaker) produce a heavy product.

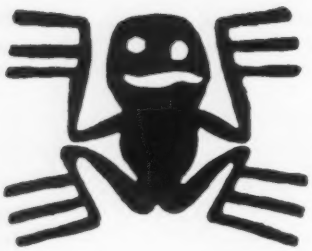
Here's a mixing suggestion: If heat generated during grinding reached 150F. (sufficient to melt hydrogenated fat), no further mixing is necessary. Otherwise, the pecan butter must be heated to 150F., followed by a 5-min. agitation (slow speed) to assure uniform blending.

Final step requires product to be packed into air-tight, grease-proof containers. This is needed to prevent oil from "crawling" up the container (along inner sidewalls of headspace) and causing the product to become stale and rancid (due to air exposure). Suitable are 6-, 8-, or 16-oz. jars, cans, or collapsible tubes. (End)

Composition of Pecan Meats*

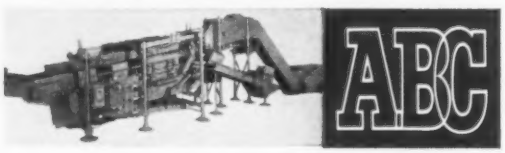
Constituent	Amount
Water	3.0%
Ash	1.6%
Fat	73.0%
Protein	9.4%
Carbohydrates (Total)	13.0%
Fiber	(2.2%)
Sugar	(3.9%)
The following are per 100 gm. portion:	
Food Energy	696 cal.
Carotene (Vit. A)	50.00 I.U.
Thiamine	0.72 mg.
Riboflavin	0.11 mg.
Niacin	0.90 mg.
Calcium	74.00 mg.
Phosphorous	324.00 mg.
Iron	2.40 mg.
Ascorbic acid	2.00 mg.

**Essentially the same as pecan butter.*



untouched by human hands

Packs 25 cases of one quart cans a minute—untouched by human hands. Works right through the coffee break, smoke break, lunch break. No down-time for headaches, backaches, stomach aches. Investigate this ABC automatic case positioner and packer right away. Better yet, right now.



ABC Automatic Case Positioner and Packer

A-B-C PACKAGING MACHINE CORPORATION
P.O. Box 1146, Clearwater, Florida

Tips to Management

Automation Committee reports progress . . . Unions disagree . . . IFT Advises

Armour Experiment: Modest Progress . . .

Only minor agreements between labor and management, such as the obvious need for an expanding economy to create new jobs for technologically displaced workers, have resulted from the efforts of the Armour Automation Committee, judging by group's latest progress report.

Committee, composed of company, union, and impartial personnel, has spent nearly two years seeking ways to minimize automation's impact on packinghouse workers. Joint report, noting that combined search has been "mutually advantageous and constructive," did manage to agree on these points:

► **Educational programs** and their relationship to future job requirements must be studied by private, local, and Federal agencies.

► **Public employment services** should be coordinated to play a more important role in helping workers find jobs. (Committee endorsed pending bill in Congress to provide relocation and retraining benefits.)

► **Displaced workers** being retrained should be allowed to stay on unemployment compensation without interrupting training to take employment.

► **Integration of public and private** pension systems should be studied as well as increased allowable earnings for early retirement.

► **Government and industry cooperation** in following three areas can help industry health and growth: Increased livestock inventories by use of surplus grain; standard minimum wage laws for industries which now include sharp differentials; and currently unrealistic Federal regulations such as the 1920 antitrust decree keeping packers out of other aspects of the food business.

. . . But Basic Problems Still Remain

Not satisfied with the joint report, unions submitted their own statement to emphasize several areas of disagreement and minimize the Committee's suggestions as "too little and too late."

Unions, the Amalgamated Meat Cutters & Butcher Workmen and the United Packinghouse Workers, pointed to differences in both "emphasis and substance" as well as the lack of "a greater sense of urgency" in the joint report.

Most notable conflict is the unions' demand for a shorter work week as being essential to approach full employment. Company members stated that resulting higher costs "would make this low-profit industry even less attractive and would require accelerated efforts to automate just to stay in business." Impartial members also opposed the reduced work week solution because "it would reduce productive capacity at the very time it ought to be expanded." Bargaining at Armour begins next month.

Unions and the IFT

Even if you're a non-supervisory technologist, you can't be forced to join a non-professional union against your will, says IFT. This legal opinion has gone out to all members in answer to a request for IFT's attitude toward unionization.

Statement explained that the professional man must be given the opportunity to vote "as a separate group" on a proposed union affiliation. A "No Union" vote means technologists "cannot be represented by the union, regardless of how the non-professional employees vote."

Clean Own House, Warns Bickmore

Referring to the low state of business ethics produced by price-fixing, conflict-of-interest practices, and other questionable endeavors, National Biscuit Pres. Lee S. Bickmore told a recent AMA gathering that "the businessman should clean up his own dirty house and not call on outside people to do it for him."

Noting the session's theme of "The Role and Influence of Federal Regulatory Agencies in Marketing," the Nabisco chief emphasized that "business put itself in this position. Legislation can render judgment and inflict punishment but only business can correct the basic, fundamental problems."

Bickmore, whose Nabisco firm is one of the few leading food/beverage companies not tainted by FTC or Justice Dept. investigation, is rapidly assuming the mantle of leading industry statesman.

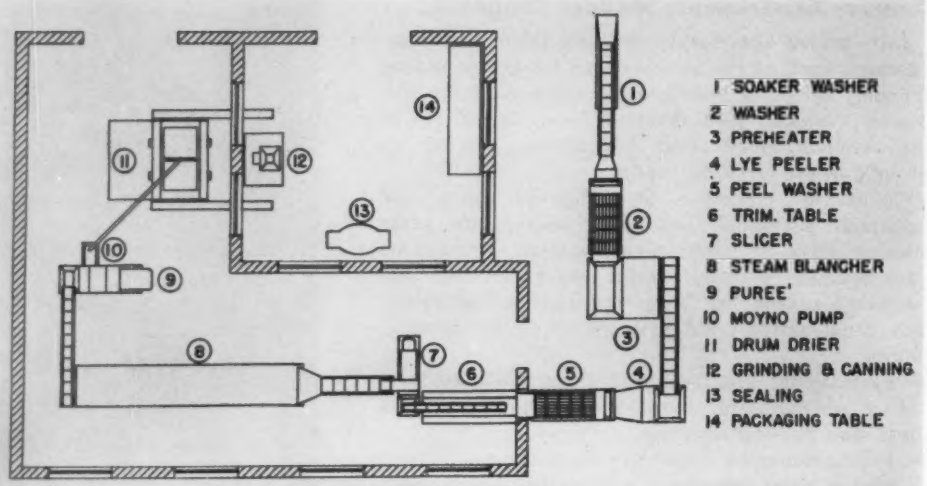
Arbitrator's Case of the Month

After seven years of service, Fred J. died in March '61, prior to the vacation period. Had he lived a few months longer, he would have a paid vacation.

Union believed that the man's widow should receive the vacation pay. Company disagreed, saying, "The contract says nothing about deceased employees. If it was intended to give vacation pay to the heirs of such an employee, it would have been spelled out in the agreement."

THE AWARD: Arbitrator observed that the contract provided for vacation money in December for employees who didn't take time off during the vacation period. That, as well as other details, convinced him the vacation plan was of the kind that regarded vacation pay as "deferred earnings." Union won the case and the widow got the money. (Files of the American Arbitration Assn.)

PLAN VIEW shows layout of pilot plant designed and constructed by the Engineering and Development Laboratory of Southern Utilization Research and Development Division. Process is continuous from soaker-washer (1) to packaging (14), and can be installed commercially.



DEHYDRATED SWEETPOTATO FLAKE PILOT PLANT

Continuous pilot plant process produces . . .

Precooked Dehydrated Sweetpotato Flakes

PRODUCING QUALITY precooked dehydrated sweetpotato flakes is now possible as a result of work by the Southern Utilization Research and Development Division, Agricultural Research Service, U.S.D.A. Processing principles developed by this group can be applied to the production of other precooked dehydrated flaked products.

The Engineering and Development Laboratory of this Division designed and constructed a pilot plant to produce samples for evaluation, and to adapt standard equipment as far as practical to the process. **Since the processing is continuous and the equipment is of commercial type, the pilot plant is considered to be a prototype for a commercial installation.**

The pilot plant was installed in an overall area of about 24 x 42 ft. (see above diagram). All operations after peel washing and including the can sealing operation are conducted within a tiled room area under sanitary operating conditions. The packaging room is further separated by tile walls because of the high humidity prevalent in the cooking and drying areas.

J. J. SPADARE AND E. L. PATTON
Southern Regional Research Laboratory
New Orleans, La.

Steps in Processing

► Raw Material . . .

Field-run Goldrush variety of sweetpotatoes have been used to date in all the pilot plant experimental runs. The sweetpotatoes were cured for two weeks and stored at 60F. prior to use. Goldrush is one of the most widely grown varieties in Louisiana.

► Washing . . .

Sweetpotatoes were fed at a constant rate of 300 lb./hr. to the soaker-washer unit where they were given a preliminary washing with cold water. Final and thorough washing was done in a rod-reel type washer.

► Preheating . . .

The preheating conditions, immersing in water (160F. for 30 min.) were standard practice used in the early work. The 30-min. time appeared to be too long for practical commercial operations. Since the optimum preheat conditions are not known, the preheater was designed to evaluate variable preheat times of 6 to 30 min. at various temperatures and also for no preheat. As the sweetpotatoes enter the preheater they are kept submerged for the predetermined time by the flights mounted on a continuous rotating steel belt.

► Lye-peeling . . .

The ferris-wheel type lye-peeler was based on that designed originally at the Southern Regional Research Laboratory for the preparation of dehydrated diced sweetpotatoes. Retention time in the lye-peeler is 5-6 min. in a 20-22% lye solution at 220F. Sweetpotatoes with loosened peel are next discharged from the lye-bath into a standard rod-reel type washer.

The peel and lye are thoroughly washed away with water from pressure spray nozzles while being tumbled through the washer.

► Trimming . . .

The discharge end of the washer protrudes through the tile wall where the peeled sweetpotatoes drop into a weak sulfite solution in the center of the trim table. The only hand operation in the process takes place at this trimming table where the fiberous ends and surface defects are removed. After trimming, the potatoes are placed on a conveyor over the table which leads to the slicer. It is estimated that one person can trim at least 300 lb. of raw potatoes per hour.

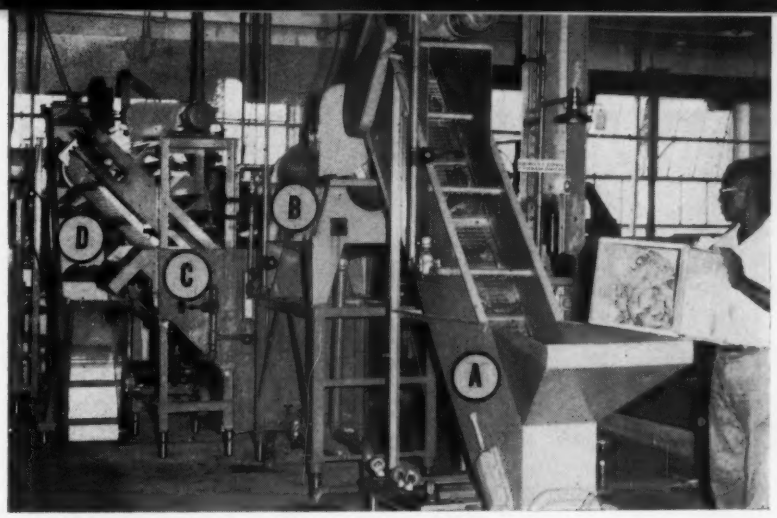
► Slicing . . .

Peeled and trimmed potatoes are next cut to half-inch slices using a conventional food slicing machine.

► Steam Blanching . . .

The sweetpotatoes then enter the blancher where they are cooked for 30 min. in atmospheric steam. The chute to the blancher was designed to spread the sweetpotatoes evenly over the 30-inch wide, continuous stainless steel wire belt. The belt load averages approximately 4 lb./sq. ft. Temperature within the blancher was maintained at 210-212F. From the discharge end of the blancher the potatoes drop onto a smooth belt conveyor.

Additional studies are required for the cooking phase of the process to improve efficiency since some solids are extracted during the blanching operation. Investigations are planned on the methods of cooking such as in water, in syrup, or on the add-back of condensate in steam cooking to recover the solids to increase yields.



RAW SWEETPOTATOES are fed into soaker-washer (A), go through washer (B) and preheater (C). On discharge from preheater they move up transport (D) to lye peeler (hidden from view).

► Pureeing . . .

Cooked sweetpotatoes are pureed in a conventional blade-type machine which forces them through a perforated screen with 0.055 in. holes. Water, sulfite solution, and other chemicals such as antioxidants, if used, are added to the cooked sweetpotatoes at the pureeing machine. To attain initial mashing of the cooked material and mixing of the additives, a rod-type stirrer was installed in the feed hopper.

Water is added to attain a puree of 20% solids which, to date, has proven satisfactory for application of the puree to the double-drum dryer. Further work is contemplated in drying purees with higher solids content. Sulfite solution is added in the form of sodium bisulfite (2 parts) and sodium sulfite (6 parts) to attain a total of 300 p.p.m. of sulphur dioxide to the puree, dry weight basis. A commercial antioxidant, when used, is added at the appropriate rate. A hopper located below the pureeing machine serves as a surge tank from which the puree is pumped to the dryer.

► Drying . . .

A good dehydrated flake has been produced at the rate of 1.5 lb./sq.ft. of surface area using the following conditions: Steam pressure in drums—85 psig; retention time on the rolls—20 sec.; dryer speed—2 rpm; space between rolls—0.005 in.; and level of puree between rolls—three-fourths of the distance from the nip to the top of the rolls.

Moisture contents of the resulting flakes have ranged from 2 to 4%, and flake thicknesses from about 0.010 to 0.020 in. The dryer operating conditions are not considered optimum and, consequently, experiments are underway to determine the optimum conditions. Dehydrated sheets of precooked sweetpotatoes emerge from the dryer rolls and are discharged on the outer side of both rolls into conveyors which break the sheet and transfer the product into the grinding and packaging room.

DEHYDRATED sheet of precooked product emerges from dryer roll onto conveyor which breaks sheet and transfers to grinding and packaging room.

GRINDER reduces size of flakes to about 1/16 to ¼ in. diameter.

► **Grinding . . .**

A "coconut" grinder is used to decrease the size of the flakes to about 1/16 to ¼ in. dia. The two multitoothed rolls turn at different speeds to attain the grinding action.

► **Packaging . . .**

Based on previous experimental work, the flaked product has been packed in metal cans in an atmosphere of nitrogen containing less than 2% oxygen. A commercial single-can type sealing machine is equipped for evacuating and gassing the chamber prior to sealing the can. Studies are underway for evaluating other methods of packaging such as flexible packages and glass jars.

Pilot Plant Performance

The pilot plant has been operated continuously for three to five-hr. periods and in one case for 12 hr. Most of the initial runs were for the purpose of attaining satisfactory continuous flow between and through each of processing units. Runs were also made to evaluate operating conditions as determined previously on a prepilot plant scale, and to produce material for preliminary product evaluation.

A quality product has been produced using the continuous processing conditions in the pilot plant described here. Many other factors require further evaluation: Effect of preheating times and temperatures, method of cooking, optimum dehydration conditions, method of packaging, and stabilization of the product during storage.

Reconstitution of the dehydrated flakes is very simple. It takes only about 60 sec. Equal volume of hot water or milk is added to the flakes and stirred lightly (on a weight basis 1 part by weight of flakes to 3 of liquid). The reconstituted flakes can be eaten as mashed sweetpotatoes with or without additional seasoning, and can also be used for pie filling, in casserole dishes, and in a large number of other food recipes.

(End)

Acknowledgment: Authors wish to express their appreciation to G. I. Pittman and A. L. Fayette for the preparation of drawings and photographs, respectively.

Speed up your production by using the

BALCRANK STAINLESS STEEL

air-operated Reciprocating Transfer Pump

Picture shows Original Crispy Co., Bronx, New York, transferring Pizza Sauce using BALCRANK P-161 STAINLESS STEEL PUMP from Sterilpac Container manufactured by Rheem Mfg. Company, Linden, New Jersey.

After removing drum head, using a Wizzard Drum Cover Opener, the 55 gallon container is pumped empty in 3½ minutes.

BALCRANK MODEL P-161 STAINLESS STEEL Pump with Drum Clamp transfers all concentrates of Tomato Paste, 26% to 36%, Peach and Pear Concentrates, Pizza Sauce, Ketchup, All Fruit Juices, Vegetable Oils and liquid food products.

Pump is light in weight, will out-perform conventional method of emptying #10 cans by two-to-one production ratio.

Distributors wanted.

Wire or write Balcrank Inc., Cincinnati 9, Ohio, for literature and prices.

Photo courtesy Rheem Manufacturing, Container Division

BALCRANK, inc. 10 Disney Street, Cincinnati 9, Ohio

Give your product slices the *"beauty treatment"* with the Urschel high speed Model "OV" TRANSVERSE SLICER

Urschel Model "OV" Slicer

Clean, uniform, better-than-ever cross-cuts on

PICKLES
CARROTS
CELERY
RHUBARB
BROCCOLI
Ookra
SQUASH
BAMBOO SHOOTS
WATER CHESTNUTS

Plain Slices

Corrugated Slices

OPERATING PRINCIPLE

The product to be cut is dropped into a hopper through which it feeds onto two high speed conveyor belts, each sloping inwardly to form a "V" cross-section. • A third conveyor belt then comes down over the top to complete the product enclosure. • Thus, the product enters the slicing wheel completely surrounded by moving conveyor belts and slicing wheel corrugated rolls which insures its positive feed into the knives. • This action virtually eliminates plugging of the machine, and, since the feed to the knives is positive, "thin" slices occur infrequently. • The new unit is so positive in its feeding action that it will feed leafy products easily. • The "V" shape formed by the belts keeps the product in constant alignment with the cutting knives regardless of product diameter, practically eliminating "bias" cuts.

- ***Positive*** **feed action.**
- **No product crushing.**
- **Practically eliminates "thin" or "bias" cuts.**
- **Cuts thicknesses from 1/16" to 1-1/3".**
- **High capacity feeding with maximum cutting yield.**
- **Compact—engineered for long dependable service and low maintenance.**

PRECISION HIGH-SPEED FOOD CUTTING EQUIPMENT

URSCHEL LABORATORIES INC.
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Designers and manufacturers of precision high speed cutting equipment for food products

Stretching Machinery Benefits

Matching automatic units to film's demands boosts performance . . . Here are working aids on how to maximize the economies of polyethylene overwraps

COST SAVINGS potential has boomed polyethylene film into a prominent role in food packaging operations. And as the technical difficulties initially encountered are rapidly overcome by development and refinement of wrapping machinery and conversion units, the plastic film is sure to become even more important. How can you profit most from these engineering advances?

Here are basic factors to keep in mind for a successful polyethylene wrapping operation:

1. Maintenance

Folding settings must be readjusted every time the machine is converted from cellophane or waxed paper to poly because the plastic requires greater care and closer tolerances. However, if set for poly, the wrapper should work well with wax paper or cello and will not necessarily have to be readjusted.

WILLIAM U. FUNK
Sales Development Engineer-Films,
U. S. Industrial Chemicals

2. Tension/Shearing

Poly is more elastic than cello or waxed paper, also has a lower slip factor. Thus, for proper tension, you need such devices as counter-weighted drag bands, a variable paper speed drive, a paper feed clutch actuated by a float stick, and an adjustable band-centering guide. Because cutting results from a shearing rather than cutting action, a honed knife is not necessary—a file-sharpened blade does the trick.

3. Sealing

Poly has a narrow sealing range, hence temperatures must be held below the film's melting point but above the softening point. Time is the critical factor here.

Pressure is difficult to control because of variations in product shape and hardness — such as bread. Only heat and dwell time can be controlled. Dwell time is regulated by various devices substituted for the stationary bottom sealing plates found in cellophane or waxed paper packages.

Since dwell time is affected by machinery speed, raising or lowering the wrapping rate must be matched by similar changes in temperature to achieve a good seal. Accurate heat controls are necessary, as conventional thermostats used in waxed paper or cellophane overwrapping are inadequate.

4. Sealing Devices

Bottom—A continuously moving slat conveyor with spaced heater bars is one type of bottom heat sealer. Other devices include reciprocating heating plates or the simple covering of the regular bottom plate with a silicone material. Gravity rollers can be used for additional tacking seals.

Ends—These seals are achieved by heating paper and labels and the poly film with glass fiber belts, wire mesh belts covered with Teflon impregnated covers, or with silicone impregnated covers as the product travels along its normal path. New end labels with low melting adhesives, which tack-on at temperatures 100 deg. F. below minimums required to seal poly,

have solved a former problem of film burning under and around the end label.

5. Voltage Controls

These have been substituted for conventional thermostats on some equipment, but more often temperature control is accomplished with electronic or very high quality bulb type units. Many devices will control temperatures within two or three degrees, whereas old type controls often varied more than 25 deg. F.

6. Insulated Heating Materials

All heated parts must be insulated with special coatings or removable insulating cloth covers. Fabrics treated with fluorocarbons or silicone prevent drag (sticking of film to heated equipment), as do molybdenum disulfide coated heaters.

7. Conveyor Belts

Poly can be closed with conventional slide seals, as has been demonstrated by several conversion units. But many such devices incorporate conveyor belts to permit the movement of heated surface with the film.

8. Tucker Arms

Instead of the tapered tucker arms used for waxed paper and cellophane, square shaped arms, which hold the folds better, are now popular. These are not provided with heaters.

9. Refrigerated ("polar") Plates

Placed on the ends and at the bottom of the bread loaf, they cool the film, speed up sealing. Sometimes they are supplemented by refrigerated rollers.

SPACE SAVER: Compact poly packager (A) builds bag around frozen steak, takes up only 10 sq. ft. Meat cuts then pass through heat tunnel (B) which shrinks sack to product shape.

Poly Wrapper Pays Off—3 Ways

One outfit that has struck paydirt with polyethylene film is Table Supply Meat Co., Omaha, Neb. Sales have perked up 50% since the hotel and restaurant purveyor switched from a manual cellophane operation to an automatic poly set-up for its specialty steaks.

Outfit uses a one-step See-Safe Model MA packager (Mehl Mfg. Co.) to build a poly bag around each steak. Sack is shrunk in an auxiliary heat tunnel unit for closer conformity to steak size and shape, then cuts are frozen and packed in cartons.

Alan D. Simon, general manager, says that "Before installing the new equipment and film, we used cellophane in manual operation. From a packaging material standpoint alone, we have cut costs in half by going to poly.

"Just as important, we have more than tripled our packaging rate. New unit wraps at a 30/min. rate, compared to 8/min. in the old operation."

"Perhaps best of all," he adds "the machine is priced at about one-fifth that of competitive units. Thus, we can meet the fast-growing demand for our products while maintaining strict cost control."

Working Aids

Operation of poly wrappers, more intricate than for cellophane and waxed paper units, calls for greater care and skill.

While estimates vary concerning the length of time it takes to train operators to satisfactorily handle poly wrappers, it is generally agreed that the plastic's narrow heat sealing range and other sensitive characteristics require greater attention on the part of operators and foremen.

Heat control gages must be set in accordance with temperature and humidity conditions, which vary from day to day and even more from season to season. Temperatures must be checked periodically, changed if speed is altered, and may have to be lowered after prolonged use of the overwrap machines (as heat builds up). Equipment should also be checked periodically for re-alignment of film feed and other parts.

Opinions differ as to the relative merits of conversion attachments currently on the market. It seems generally true, however, that a good deal of adjustment and testing by your engineering department, with the help of the machinery or conversion attachment manufacturers, is necessary.

In many cases, refinements have been devised by engineers. Continental Baking, for example, reports that, although it does use commercially available parts, its poly wrapping equipment is, in the last analysis, its own design.

One frequent problem which seems to be well on the way towards successful solution has been the lack of film uniformity. Variations in film gage led to heat-sealing difficulties, particularly at the end folds, where four layers of film were involved.

At first, gage variations of plus or minus 30% were not uncommon. These have now been reduced to approximately plus or minus 10%, and coupled with the improved heat controlling devices, the problem is being overcome. (End)

Which of these features do you look for in a FOOD OR BEVERAGE HOSE?

Freedom from Odors and Taste?
Ease of Cleaning and Sterilizing?
Transparency?
Flexibility?
Long Service Life?
Wide Range of Standard Sizes?

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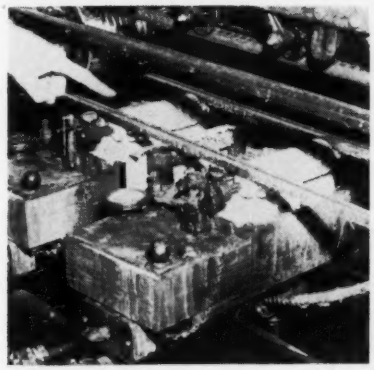
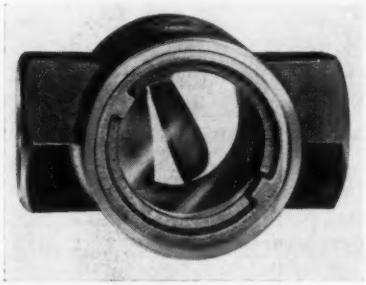
Practical Ideas



Cuts Labeling Costs

C. H. Musselman Co. saved 30% on label adhesive when it replaced its solid rubber applicator roller with one having a raised surface.

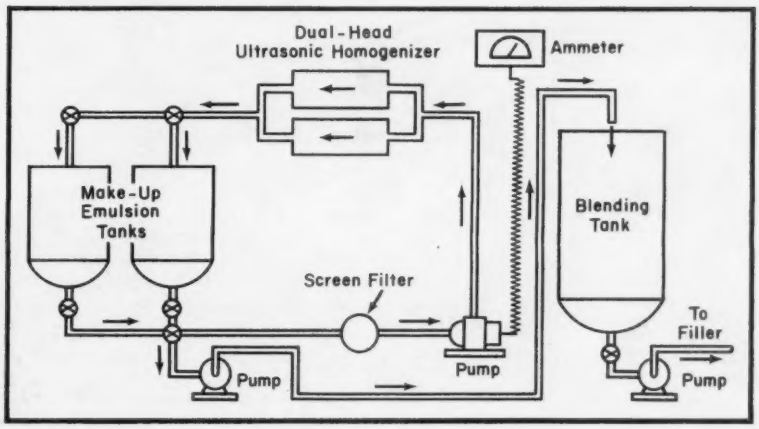
As shown in operation at the company's Biglersville, Pa., plant, the roller has "valleys" which limit the amount of adhesive transferred to 70% of that formerly used. Labels hold just as well, however—*P. Lance, Phila.*



'Sees' Into Pipelines

This sight flow indicator lets you look inside a pipeline to see whether there is flow and, if so, the direction and condition of the fluid.

Unit has double sight glasses for clear observation even under poor lighting conditions. Machined recesses and retaining rings for even seating of gaskets prevent leakage. Easily installed indicator called "Flo-Eye," is supplied by *Schutte and Koerting Co., Cornwells Heights, Bucks County, Pa.*



Ultrasonics Produces Higher-Quality Beverages

Processors of flavor emulsions are finding that a dual-head ultrasonic homogenizer improves product stability. This, in turn, means better tasting, more attractive finished beverages.

Moreover, the ultrasonic technique offers impressive savings in initial equipment cost, operation, cleaning, and space.

In a typical set up (diagram), emulsion is pumped to each homogenizer as a high-pressure jet that impinges on the edge of a blade within the unit. Kinetic energy of the streams causes the blades to vibrate at about 22,000 cps., and the resulting cavitation ("cold boiling") effect is primarily responsible for efficient homogenization.

Note that ultrasonic waves are produced by the fluid being processed, instead of being generated externally. Capacity of the system is 5-25 gpm., depending on emulsion viscosity.

An interesting feature of the illustrated system is use of an ammeter to control homogenization pressure, rather than the conventional pressure gage. It was found that pressure readings did not correlate well enough with particle size to give consistent results with a variety of emulsions. However, energy input to the motor driving the pump does establish optimum operating pressure for each product.

Thus, the operator can readily get duplicate results by adjusting the pump's by-pass for the ammeter reading he wants.

The homogenizer is supplied by *Sonic Engineering Corp., 146 Selleck St., Stamford, Conn.*

Simple Test Checks For Proper Lubrication

How can you tell whether foodplant equipment is being properly lubricated?

The stopping-time test is simple and reliable. To check a motor, for example, see how long it takes to come to a stop after shutting off the current. The longer the stopping time the better.

The above test is based on the fact that a body in motion has a definite amount of energy stored in it when running at normal speed. When power is suddenly shut off, an equal amount of energy is dissipated. By noting the stopping time every night and altering the quantity of lubricant applied, the proper quality and amount of lubricant can easily be determined.

Try the stopping-time test with and without load. Stopping time is,

Dillon's Model Food Center, Hutchinson, Kansas

STYROFOAM®

Dow Approved Insulation Contractor for new Food Distribution Center ..."so efficient we had only to review inspection reports"

"We selected a Dow Approved Insulation Contractor to install 370,000 board feet of Styrofoam in our new Food Center," says Ray E. Dillon, President of J. S. Dillon & Sons Stores Company, Inc., Hutchinson, Kansas. "We've used Styrofoam insulation board in our stores for several years and its performance has been excellent.

Mr. Ray E. Dillon, President, J. S. Dillon & Sons Stores Company, Inc.

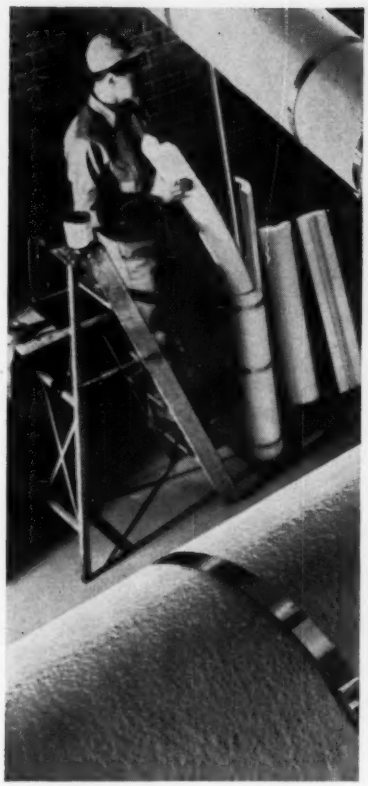
"The AIC (Mid-Continent Industrial Insulation Co. of Kansas City, Kans.) gave us the best possible installation at reasonable cost. He took care of all details and was so efficient that we had only to review weekly inspection reports."

Dillon's new Food Center is completely insulated with Styrofoam in produce wet-and-dry coolers, banana cooler rooms, and in the frozen food section. Styrofoam provides a *permanent* low "K" factor, won't soak up water or water vapor, won't freeze, swell or crack. And Styrofoam is so easy to handle that installation time is reduced to a minimum.

The Dow AIC seal is displayed only by insulation contractors carefully selected for their excellent business reputation and high quality workmanship. For the names of the AICs nearest you, write THE DOW CHEMICAL COMPANY, Midland, Michigan, Plastics Sales Department 1541KE7.

Styrofoam is a registered trademark of The Dow Chemical Company. It is applied only to the homogeneous expanded polystyrene made according to an exclusive Dow process. Styrofoam brand insulation board is available only from Dow and its authorized representatives.

THE DOW CHEMICAL COMPANY DOW Midland, Michigan



Stops moisture...

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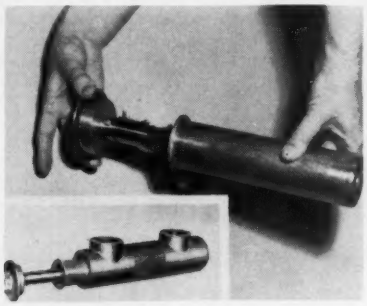
Low-temperature pipe covering made of Styrofoam does an excellent job and requires minimum maintenance. Its unyielding resistance to moisture and its permanent low thermal conductivity prevent condensation and dripping—reduce heat transfer.

Pipe covering made of Styrofoam will not crack or split from thermal shock. Since it does not absorb water, it is not affected by ice build-up around uninsulated valves. It's lightweight and easy to apply. A complete line of pipe and vessel covering made from Styrofoam is available from the following fabricators:

COLUMBIA ASBESTOS CO., Portland, Ore. • ENGINEERED FOAM PLASTICS CORP., Elkhart, Indiana • GLO-BRITE PRODUCTS INC., Chicago, Illinois • KENNEDY INDUSTRIES, Los Angeles, California • KRANSCO MANUFACTURING COMPANY, South San Francisco, California • MMM INCORPORATED, Houston, Texas • ROBINSON INDUSTRIES, Coleman, Michigan • STYRO FABRICATORS, Kansas City, Kansas • STYROFORMICS, INC., Somerville, Mass. • STYROPLASTICS, INCORPORATED, Minneapolis, Minnesota • TUFFLITE PLASTICS, INC., Ballston Spa, New York

DOW

of course, much less with load. But a difference in stopping time, all other conditions being the same, indicates a difference in lubrication or friction.—*W. F. Schaphorst, M. E., 45 Academy St., Newark, N. J.*



Filtering Magnetic Trap

Both iron contamination and non-magnetic particles may be removed by this in-line combined ferrous trap and filter. Moreover, the unit is quickly disassembled for easy cleaning.

It has a 1-in. stainless-steel permanent tube magnet enclosed in a 2-in.-dia. perforated bronze filter screen with either .020 or .033-in. holes. Magnet and filter are enclosed in a 350-psi. bronze casting (inset photo) which has a standard 2-in. pipe thread inlet and outlet. Adapter connections permit the trap's use on lines of various sizes.

Fluids can be passed over the magnet first and then through the filter, or vice versa. Supplied by *Eriez Mfg. Co., Erie, Pa.*

Simple Program Control

This function generator easily converts your manual set-point control to automatic program control.

Just add a pencil-drawn program curve and connect three wires from its output potentiometer to your present circuits. As the instrument stylus follows your program it turns a control potentiometer. Up to four 3-gang potentiometers may be driven by the same follower mechanism to provide up to 12 separate synchronized control signals.

Entire mechanism fits a standard electronic rack, and standard strip-chart recorder paper may be used for the program chart. Manufacturer is *Research, Inc., Box 6164, Minneapolis.*

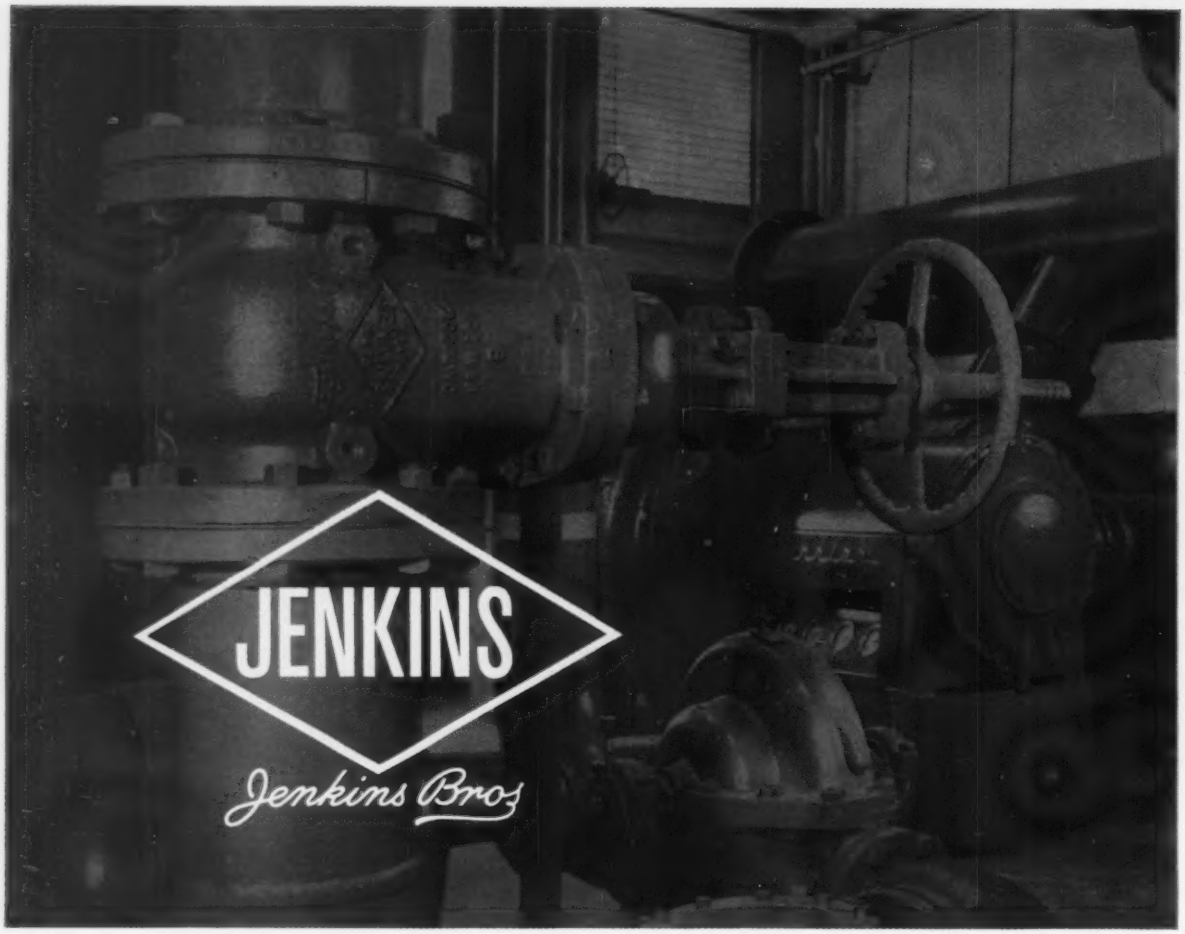
Latest freight-car design, featuring single outlet for pneumatic unloading of granular products, saves time and labor. Entirely self-cleansing system was developed by Pullman-Standard, Chicago, in cooperation with Ladish Malting Co. and prominent brewers.

Plastic Tanker Eliminates Leaks, Cuts Maintenance

Leakage is no problem with this tank truck of FDA-approved fibre polyester resin. Moreover, it offers a 20% saving in maintenance over comparable metal units.

Illustrated tanker is leased by Standard Brands, Peekskill, N. Y., to haul vinegar, alcohol, and similar products. It is corrosion resistant, ordinarily requires no insulation, and has no linings or coatings.

Unit has three compartments with capacities of 500, 1,500 and 2,500 gal., respectively. The tank was developed by *Beetle Plastics Corp., Fall River, Mass.*



The Sign of a Real Bargain in an IRON BODY GATE

Cost-Per-Year is Lower... Initial Cost no Higher

For generations extra-quality, extra-stamina Jenkins Iron Body Gates were regarded as the best buy for the money . . . even though they cost more to buy. Lower maintenance expense and extra years of service more than offset any price differential.

Today, these widely favored valves are an even bigger bargain in true value. *You pay no more for them at the start!* And you get exactly the same high quality and perfection of design for your money.

You can satisfy all your needs from the complete line of Jenkins Iron Body Valves. Jenkins Bros., 100 Park Avenue, New York 17.

AVAILABLE FROM LEADING DISTRIBUTORS EVERYWHERE

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MOST TRUSTED TRADEMARK IN THE VALVE WORLD
VALVES
JENKINS SINCE 1864 Jenkins Bros

Doing It Better

J. A. FOLGER & CO.

Cuts Truck-Unloading Time 50%, Simplifies Handling

THREE HINGED ROLL SECTIONS are start of unique truck-unloading and storage-conveyor system for palletized bagged coffee at J. A. Folger & Co., Portland, Ore. Roll sections are flipped into back of truck, so entire 40,000-lb. load can be pulled from truck as a unit and sent to . . .

. . . **SCALE CONVEYOR,** where two pallets are weighed at a time. Simultaneously, operator samples the load and codes it. As scale conveyor advances intermittently, pallets break a photocell beam to actuate storage conveyor (left). When pallets reach end of conveyor, they are picked off by . . .

. . . **FORK TRUCK,** which transfers them to storage. The three conveyor sections are powered by individual drives and controlled from the scale station. The system, which has cut truck-unloading time 50%, handles a shipment in about 15 min. It was engineered by Link-Belt Co. **(201)**

FRESNO MACARONI MFG. CO.

Uses Self-Adjusting Sealer

For quicker and easier sealing of multi-size cases at Fresno Macaroni Mfg. Co., Fresno, Calif., the company has installed a tape-sealing unit that automatically adjusts to handle cases of varying width and height. The machine closes the cases and seals them on top and bottom at the same time.

After being inspected, cases are conveyed to the sealer in groups of 2-12 of a given size. The operator then pushes a conveniently located remote-control switch, which starts the machine through its automatic self-adjusting cycle for that particular case size. As the last case of that size clears through the unit, the operator merely flips the control switch to re-set the sealer for the size of the next group of cases.

The unit was supplied by General Corrugated Machinery Co., Palisades Park, N. J. **(202)**

Union Packing Co., Los Angeles, has cut beef-shroud costs 60% by switching to longer-lasting cloths of ramie. They do a superior job of bleaching fat and removing bloodstains, also are easily laundered. Shrouds are supplied by Bemis Bro. Bag Co., St. Louis. (205)

Charms, Bloomfield, N. J., now overwraps its 20-unit candy trays with polyethylene film—which has virtually eliminated wrapper breakage. Cardboard trays are packaged in 1½-mil film at about 72 per min. The polyethylene is made by Union Carbide Plastics Co., New York City. (206)

Yohay Baking Co., Brooklyn, N. Y., uses Teflon coatings on its ice-cream-cone molds to ease release of baked cones. Result has been higher production, less waste, and a desirably sweeter product (sugar in the dough previously aggravated the sticking problem). Coatings were applied by Tri-Point Industries, Inc., Albertson, N. Y. **(207).**

The Kroger Co., Wabash, Ind., automates egg handling with an electro-mechanical unit that can grade, process, and package over 1,700 dozen per hr. Developed by Food Machinery & Chemical Corp., Riverside, Calif., system includes semi-automatic mass candling, washer-dryer cleaning cycle, and automatic blood-spot detection. **(208)**

Carnation Co., Wichita Falls, Tex., monitors its 2-stage refrigeration system (400 ton) with a level-indicating control. The float switch provides high-level alarm, compressor cut-off protection, etc., and visual assurance that controls are functioning properly. Unit is made by H. H. McKinnies Co., Milwaukee. **(209)**

ONE OF A SERIES OF CHATS ABOUT CONSERVATION AND CONTROL OF HEAT

SARCO TOPICS

PROBLEMS OF PRECISE TEMPERATURES IN WINE PASTEURIZATION

It's a shame that so many people think you throw grapes in a vat, press them, bottle the juice, and just wait a while to create wine. Even those who pride themselves on their knowledge of wines are seldom aware of the artful engineering required. Pasteurizing wine is actually much more delicate and tricky than pasteurizing milk.

Take temperatures. Wine must be pasteurized at 140°F. And spoilage can cause economic havoc. Those are the facts of life in the world of wine. They might not seem too difficult to live with unless you're in the wine or food processing business. Then you probably know how tough things can get when you have a rendezvous with a thermometer.

Take New York's Monarch Wine Company, producers of Manischewitz Wines. Their Problem: how to maintain the 140° temperature in the heat exchangers despite wide variations in the rate of wine flow. These variations, between 5 to 60 gallons per minute, result from slowdowns and recoveries in the bottling process. Problem: entire system must be capable of complete shutdown when necessary. Problem: wine temperatures must be raised to 140° as rapidly as possible, sometimes an immediate jump of 100°.

Attracted perhaps by aspects of the situation that had little to do with pure science, Sarco engineers applied the collective experience of Sarco technology to the solution of this serious problem. The result for Monarch: the *degree of control* the process demanded—achieved through the excellent use of Sarco Temperature-Pressure Regulators, Float Thermostatic Steam Traps, Thermo-Dynamic Steam Traps, and Pipeline Strainers.

Sarco engineers, ever resourceful, divided each of the two large Cherry-Burrell plate-type heat exchanger units into two separate sections with a blank baffle plate, each with a separate Sarco control. Thermal sensing bulbs were installed in wine discharge and throttling controls hooked into steam supply. As demand

fluctuates, one or both regulators function to maintain the 140° temperature. In higher demand, both regulators are operative; as demand drops and flow decreases, only one regulator supplies steam. Pasteur himself would have been elated.

Each of six smaller capacity shell-and-tube heat exchangers required only one regulator, with sensing bulb inserted into the outlet side of the wine filled shell, and the regulator throttling steam supply to the tube section. Thus, by controlling flow of steam to the exchangers on the basis of pressure and temperature, the Sarco regulators were able to maintain the temperature of the wine at precisely 140° regardless of fluctuations in demand or supply rate. Whew! A lot of engineering went into those two sentences.

From here on it's downhill. To secure complete cut off of the steam supply during scheduled shut-downs of the bottling run, solenoid valves were provided to supplement normal modulating action of the controls. To discharge widely varying loads of condensate continuously and remove immediately all air and incondensible gases, Sarco Float Thermostatic Steam Traps were installed on all condensate outlets. On the drips before each control valve a Sarco Thermo-Dynamic Steam Trap was installed to insure delivery of dry steam. Sarco Pipeline Strainers were installed before all steam traps and valves to protect them against damage by any foreign bodies. And thus ends a classic story of the grape.

Still, this story has been condensed far too much, really, and we feel you've been cheated out of the story's more delicious details. You needn't be, however. We've printed the facts in detail for posterity and you in Sarco Case History 185, complete with drawings that practically make it a do-it-yourself kit. If you would like a copy, we will be flattered to receive your request, and dispatch it with dispatch.

WE'RE ALWAYS IN . . . AND THE WELCOME MAT'S OUT

We always take it for granted that if you are going to be in the vicinity of our plant you'll phone or drop us a line so we can invite you to visit us. You'll find that our factory in Bethlehem, Pennsylvania, is on many well-travelled routes, and that our steam laboratory has much to offer in interest and helpfulness.

Forgive us for being immodest, but the lab is the most up-to-date of its kind in the country.

When you visit us, don't allow yourself to get sidetracked by the drill presses and automatic lathes. We're proud of this equipment but you've probably seen metal mutilated before, and it's our steam laboratory that's unique. We promise you a good show, and if you have any problems, bring them along. We'll solve them while you wait.

ANYONE FOR KEY CHAINS?

We seem to have these key chains. Want one? They're much more convenient than a case. A tiny replica of a Sarco Thermo-Dynamic Steam Trap, Type TD-50 is attached, but you can always remove it if you find it too commercial. There must be many things you could use these chains for. Fishing sinkers? Lengthening a light cord, maybe? Anyway, if your Sarco Representative is out, write in.

Pardon our monopolizing the conversation in this series of paid communiques, but we're trying our best to interest you in certain subjects that concern us both—to the point where you'll communicate.

5900

SARCO

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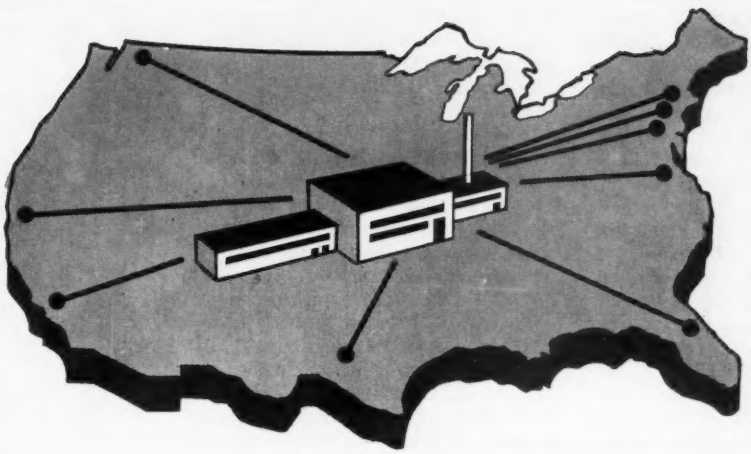
FE Special Report



DISTRIBUTION

Key to NEW PROFITS

New tools in 'logistics of marketing' are enabling alert food companies to keep ahead of critical industry trends, prune costs

MAKING MONEY while "goods are in motion"—that's the theme behind the drive to tap the distribution phases as a source for new profits.

Long neglected as "the grey area between manufacturing and marketing," the shipping of food products is being increasingly recognized as holding the key to a product's profit margin. What's needed now, food chiefs admit, is the same kind of concentrated effort that, in the past, upped the efficiency of the manufacturing and marketing ends of the business.

Distribution's ramifications on all parts of your business operations are succinctly put by Ross E. Jones, H. J. Heinz vice president. Says he: **"All the well coordinated plans of sales, marketing, and advertising departments go down the drain if the distribution system doesn't support their objectives at every end."**

J. R. Staley, Quaker Oats vice president, puts the issue in hard cash terms: "Money saved in the cost of transportation and distribution is net money. For many of us, $1,000 saved in this area is equal to the profit on $15,000 or $20,000 of business volume."

The sweeping changes in distribution touch all phases of the food industry. In the dairy field, national marketers are selling or leasing home delivery routes because of the dominance of supermarkets. Meat packers are switching to direct deliveries to eliminate costly intermediate handling. And wholesale bakers find themselves sandbagged by distribution methods that are 20 yrs. behind the times.

Spurring the increased interest in distribution are the electronic data processing units that now give management information that was too difficult to dig up heretofore. A second compelling influence are the dramatic changes in retailers' and wholesalers' operating methods. And there are some who feel that the full impact of these changes on manufacturers' distribution programs has not even been felt yet. For example, one of the implications in the trend to mass retailing points to fewer and fewer manufacturers packing according to specifications set by larger and larger buying units. Should this develop, the prime emphasis will be on developing standardized, low-cost distribution techniques.

What food makers are doing to cope with these challenges—through better organization, low cost transportation, tighter inventory controls, improved customer service—is detailed on the following pages.

FE Staff

What Does It Cost?

Distribution's price tag is a food industry enigma. One reason, as Roy Harrison, American Institute of Food Distribution, points out, is that the function "is treated too individualistically to lend itself to generalizations." In this connection, it's worth noting that when some 300 food makers were asked by an industry source to estimate their distribution costs, less than 10% could do so.

A spot check by FE among 14 companies showed distribution functions siphoning off 5.4% of sales. The spread was pretty considerable—from 2.7% (G. Heileman Brewing) to 10.2% (A. E. Staley Mfg.).

Popular belief has it that, due to rise in labor and carrier rates, distribution costs have uptrended steadily. However, there's been no study of whether productivity of the same — and increasingly mechanized—labor, as well as protective and capacity improvements in carrier equipment, have lagged or outpaced the rise in dollar rates.

U. S. Dept. of Agriculture figures that, between '45 and '55, transportation as "a portion of the retail food dollar" rose from 5.5% to 8%; as "a portion of the marketing dollar," from 10.7% to 13.2%. Neither category, of course, indicates what the function cost the manufacturer.

American Meat Institute's annual "Financial Report" suggest that the uptrend may not be as steep as USDA data imply. According to that report, meat packers' transportation costs averaged 2.4% of sales in the first half of the Fifties vs. 2.5% in the last half.

One trend that may spur greater concern with pinpointing the industry's distribution costs is the chains' integration into manufacturing. The Kefauver report on administered prices in the bread field points to the broad implications of this development.

As part of its investigation, the Senate Antitrust Subcommittee compared costs between 5 grocery chains (which produced approximately 75% of the white pan bread processed by chain grocery bakeries in '58) with the four largest wholesale bakers. The two groups showed little difference in production costs — 10.63¢/lb. for wholesale bakers, 10.72¢/lb. for chains. The big difference — and the reason why the wholesalers were hard put to match the low prices of chain-label bread—was in the distribution area. Here, costs were 4.47¢/lb. for the wholesale bakers vs. only 1.08¢/lb. for the chains.

The elements that are figured as distribution costs differ from company to company. As one example, Minute Maid lists the following: "All expenses in distributing products from the time they are received from production until they reach the final customer. This includes transportation from plant to primary warehouse, all primary warehousing expenses, freight out from those warehouses to customers to terminal warehouses, terminal warehousing expenses, and, on occasion, local deliveries." Another firm says, simply, "net transportation and public warehousing costs."

Knocking Costs Down

Alert food companies are hacking away at costs with vigor. A Gerber Products spokesman, for example, reports: "Costs are being reduced by concentrating larger stocks at fewer locations, permitting the elimination of smaller warehouses. Better inventory control has reduced our minimum stocks 25%. Thus, in the face of rising labor costs and higher freight rates, and despite the fact that prices have not increased to the same extent as costs, our shipping and storage costs have been reduced from 9.3% of sales in fiscal '51 to 7.2% in '60."

Minute Maid's attack, according to J. E. Melvin, director of traffic and warehousing, focuses on "use of a private trailer fleet, plus incentives to customers who purchase in large cars or trucks and thereby give us a rate advantage." Warehousing costs have been shaved, he continues, "by use of radio-dispatch systems for fork lift operators in primary storage locations. These small 2-way radios keep truck operators in continuous contact with the inventory department."

At Salada-Shirriff-Horsey, setting up of "agreed charges" or contract rates has helped hold the line. Firm keeps a close scrutiny on the agreements, though, to make sure "that changing distribution patterns remain flexible as well as economical," a spokesman declares.

The company feels that air freight in time may become a cost-saver despite its higher rate. That's because, a spokesman contends, the system's expense will be more than offset by the elimination of branch warehouses with their attendant inventory and rehandling expenses.

Donald F. Philp, vice president, feels there are six fruitful areas the food industry can explore for greater cost savings. These are: Pallet standardization, co-operative warehousing, damage control, rate disparities, lighter shipping containers, and minimum delivery charges.

Firm Hand on Stocks

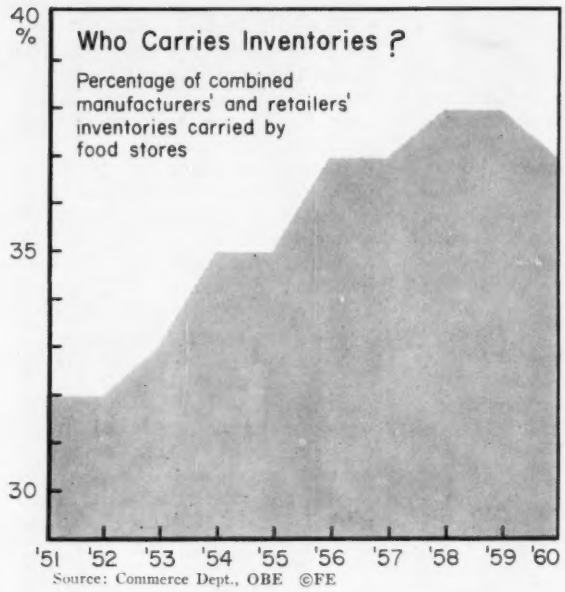
Greater productivity of capital and upgraded customer service are targets of tighter inventory control programs. Twin pressures behind this drive come from opposite directions — awareness that stockpiles of goods tie up needed capital, plus the need to keep adequate levels to avoid lost sales in supermarkets.

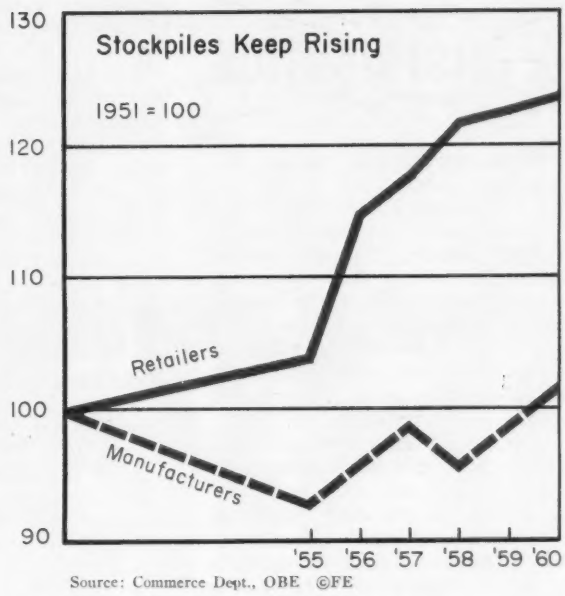
The dollars-and-cents factor is cogently put by Pillsbury Pres. Paul S. Gerot: "Better inventory management presents an annual $1-million profit opportunity for us." Lending weight to this belief is a National Industrial Conference Board finding that inventories represent 30% of average company's working capital.

And GMA's Paul Willis underscores the marketing side thusly: "You can't sell from an empty wagon. Out-of-stock results in lost sales, lost profits, lost customers. Converting existing out-of-stocks to actual sales can lift overall store volume as much as 20%."

Formal inventory control programs are steadily gaining favor. In some companies, written policy guides are used; in others, coordination between manufacturing and sales is stressed.

H. J. Heinz relies on an inventory control section to see the job through. This kind of program, contends Ross E. Jones, vice president-distribution, "re-


40
%
Who Carries Inventories ?
Percentage of combined manufacturers' and retailers' inventories carried by food stores
35
30
'51 '52 '53 '54 '55 '56 '57 '58 '59 '60
Source: Commerce Dept., OBE ©FE



INTERESTING PATTERNS: While processors complain that bigger distributors force them to carry consignments for longer periods of time, chart on the left shows that retailers have been less successful than manufacturers in licking the problem of reserve stocks. If you add the combined inventories at the manufacturing and retail levels, the distributors' share in '51 was 32%, had increased to 36% by '60. This is probably due to the greatly increased number of items a supermarket now carries—more than twice the total stocked 10 years ago. Chart on the right shows that manufacturers have done much better than retailers in keeping stockpiles down. Compared to '51, manufacturers' monthly inventories were at a lower level through '59, while retailers' stocks showed unbroken rise.

sults in fewer cut orders, smaller inventories, and greater profits. Sales department depends on IC section to see that sufficient stocks are in proper locations to avoid cutting customer orders."

Another IC function is analysis of customer and distribution warehouse orders. Through this check, IC determines the most economical shipping point depending upon mixture of goods.

Of course, food firms' inventories are not as sensitive to business cycles as are those of other consumer goods industries. Nevertheless, food makers have to reckon with the vagaries of Mother Nature and trade customers. If a seasonal pack runs heavy, the canner or freezer, for example, has to take it and store the finished product. At the same time, the bigger distributors are forcing packers to carry commitments in their own warehouses.

How Dulany Foods gets around this dilemma was described by W. W. Lang, canned food sales manager, at the recent Mid-Atlantic Sales Conference sponsored by the Tri-State Packers' Assn. The formula:

"We divide an SAP (subject to price approval) contract into 4 shipping periods. At the end of each period, we contact the customer with the idea we will cancel the unshipped balance unless he satisfies us that he is going to take it out before the contract ends.

"This arrangement gives us a chance, if the buyer isn't going to take the merchandise, to dispose of it before the new pack comes in. Before we had this system, we often had a lot of merchandise the customer didn't take, and we had to dump it at a loss frequently."

Machines Breed Need

Increased plant mechanization has spurred the trend to scientific inventory control. For, as automated production lines churn out a greater variety of goods at a faster pace, there is greater pressure to keep stockpiles from becoming unwieldy.

As a result, you find more coordination between production planning, sales objectives, and distribution management. A strong believer in this cooperative approach is Donald F. Hess, executive vice president, American Production and Inventory Control Society. He urges that inventory control and production specialists work closer together when sales forecasts are being set up.

At California & Hawaii Sugar Refining, after annual sales estimates are blocked out, production levels are established to cover delivery requirements. Actual deliveries are reviewed constantly, G. M. Clute, traffic and distribution manager, states, and sales and inventory estimates revised throughout the year.

Minute Maid created a production scheduling committee to coordinate requirements with sales, production, and distribution. Production and distribution are coordinated especially on items that can be produced on demand.

Ross Jones calls production planning "the partner of inventory control." At Heinz, he explains, "sales estimates are converted into production schedules with the cooperation of the manufacturing division. This is important in a multi-plant setup because you have to calculate and develop both the quantities to be produced at

each factory and their related distribution costs."

Coordination of production and distribution is achieved at Salada-Shirriff-Horsey through sound sales forecasting and inventory control utilizing a statistical approach. Independent goals are prepared by advertising, sales, inventory control and administration departments, then reconciled into a realistic objective.

For production purposes, forecast is broken down into months, allowing for seasonal variations. Requirements are then related to re-order points and re-order quantities (under which company's plants operate). Re-order points evaluate the (1) average anticipated movement during the lead time (it will take to replace stock) plus (2) probable variation in movement from the average during the lead time (based on past experience with a given safety stock). Amount of safety stock that's built into the re-order point is determined by the degree of risk of out-of-stock which the company considers acceptable.

Vice President Donald F. Philp says this program has proven to be a "very practical approach to providing a high degree of customer service through a minimum of out-of-stocks as well as a relatively low inventory in relation to the company's volume."

Target Helps

Sales forecasts enable McCormick to get a head start on what inventory levels to maintain during the year. Six months before the fiscal year begins, company experts block out projections by product types and package sizes.

This is done on two levels, according to Vice President Bernard Weiser. One covers normal day in and day out business; the other, special promotion campaigns, and their effect on average turnover. The second factor rates special consideration, he adds, because "of the strong possibility it can lead to out-of-stocks both at the plant and supermarket levels."

Other factors weighed for their potential effect on inventory levels are new products' relation to present items, price fluctuations, seasonal influences, new market activity, growth of related lines, and anticipated competitive activity.

Weiser cautions that "because we forecast so far in advance, we carefully evaluate our market share and any changes in that share which increased distribution can bring about." McCormick relies on continuous monthly reports from the field, and any sizeable shifts that bear on projections are reported to production so that department can revise its plans accordingly.

A complete physical inventory of finished goods is taken twice a month. Each inventory-taking, focusing on a separate category of goods, is then related to production schedules.

Weiser reports that a supplementary benefit of the scientific inventory program is stable employment costs. Because production schedules can be geared to targeted inventory turns, manufacturing is able to know when additional working shifts are needed. If a planned promotion will result in too costly an outlay for temporary employees, timing of the campaign can be moved ahead or backwards until inventory levels are brought in line with expected demand.

Hooking up production planning with inventory control has accelerated the demand for more and more kinds of information, and in shorter time, on which to base key decisions. Helping out here is the growing use of electronic data processing units.

Minute Maid's J. E. Melvin, for example, reports that "An IBM tabulating section provides our warehousing and physical inventory control departments with monthly inventories, by pack, by warehouse, indicated date each pack went into storage, amount withdrawn since that date, etc. With this information, we have been able to close out thousands of dormant and slow moving lots located at field warehouses, thus reduce costs substantially."

Harnessing Benefits

Operational methods for achieving top distribution efficiency differ according to the company's service needs. Conventionally, function is usually handled by general traffic department. But because distribution is so important to marketing, more companies are locating the responsibility in that area. And a few feel that distribution rates top echelon rank right under the president's wing.

At Kraft Foods, Director of Sales Distribution E. J. Schwartz is a member of marketing director's staff. Reason for this setup, he explains, is that "the constant change in movement of food products the past few years necessitates creation of shortest possible line from production to ultimate consumer." **Also, "because distribution is one of the most costly phases of marketing today," he continues, "it naturally becomes part of all our marketing policy planning."**

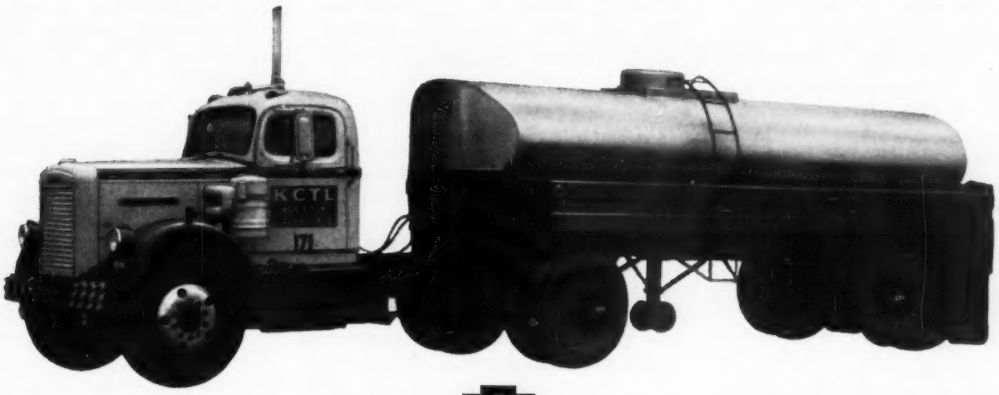
Schwartz helps product marketing managers with policy guidance on handling and movement of goods plus customer service. At the same time, he answers to the marketing director for coordination of policies and plans that go into the operation of the company's many branches as well as the servicing of distributor accounts.

Thus, while marketing managers make the sale and plan the promotions, the director of sales distribution sees to it that the product is properly protected and delivered to the distributor in line with those objectives. Organization setup at California Packing has F. H. Bergtholdt, distribution director, report directly to marketing vice president as well as chair the distribution planning and policy committee. This group has both marketing and production members to coordinate distribution with other operations.

A similar marketing-oriented tack is followed by Libby, McNeill & Libby, where each of the six newly created product divisions—Eastern, Western, Frozen Foods, International, Canadian, and Canned Meats—carries out its own warehousing and billing. Says Pres. C. S. Bridges: "New system allows for tighter cost control in warehousing, transportation, and other major areas which strongly affect margins and selling prices."

On the overall corporate level,

CUMMINS POWERED FOR PROFIT



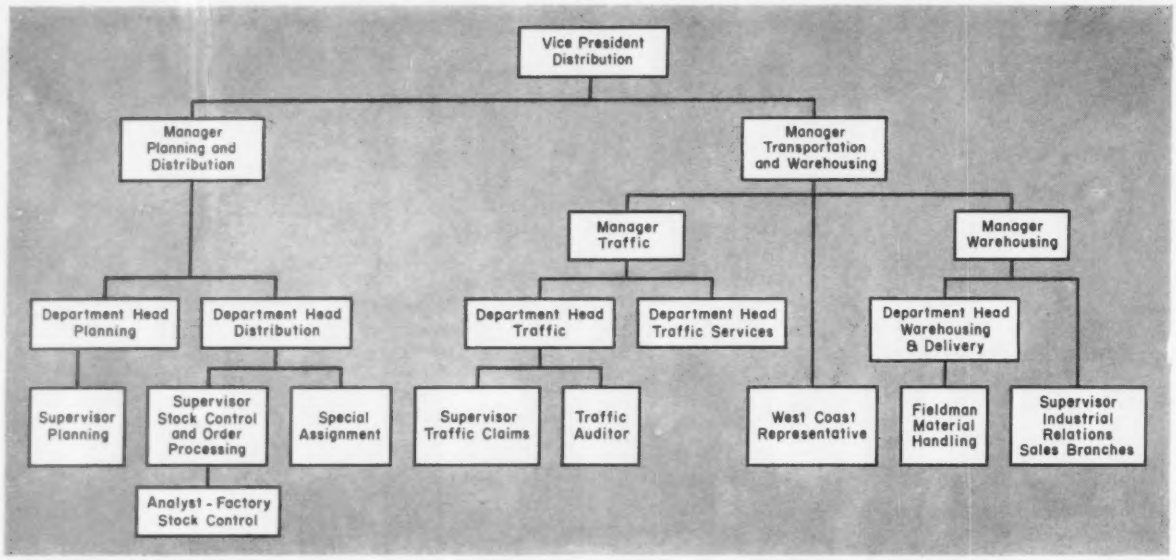
Do as KCTL did; specify Cummins Stop & Go Diesels and increase your profits

"We are getting twice as many miles per gallon on the routes where we use Cummins *Stop and Go* Diesels. We have cut our fuel bills in half and have decided to switch entirely to diesel. We are specifying all Cummins." reports Manuel Mancebo, Sr., owner of Kings County Truck Lines, Tulare, California.

You too, can cut costs in *Stop and Go* delivery service! Cummins Diesels idle four to five times longer than gasoline engines on the same amount of fuel. Engine life is typically three to four times longer. Cummins Diesels save you maintenance time and expense because they have no carburetor or electrical ignition systems, the major causes of gasoline engine trouble.

You'll start earning more profit the day you start a Cummins. Repower your present truck or specify Cummins in your new equipment. Eleven *Stop and Go* models are available from 70 to 160 horsepower. For more information read the sixteen page brochure "*Stop and Go* Diesels by Cummins." For your free copy, call your Cummins Distributor or write **Cummins Engine Company, Inc., Columbus, Ind.**

CUMMINS



DISTRIBUTION SETUP at H. J. Heinz suggests the scope of what a full-scale program involves. While it may be too elaborate for some companies in the middle- and smaller-size range, subjects listed in the departmental boxes indicate the areas that should be covered in your distribution program. Company also underscores importance it attaches to this phase of the business by having vice president of distribution report directly to the chief executive.

9 staff divisions report to Bridges. One of them, technical services, includes the distributive areas of operations research, transportation and warehousing, purchasing, and industrial engineering.

Not all the operating divisions, however, tackle distribution the same way. Frozen foods, for example, spots transportation order processing, and billing in the marketing department. Canned meats has the customer and field services department handle warehousing, transportation, order entry processing, and billing.

When C & H Sugar Refining created a new marketing division recently, traffic and distribution services were emphasized as one of the four major groups in the division. C. M. Clute, manager of the distribution services department, reports directly to the marketing v.p.

Clute lists his functions as including: "Negotiations with carriers and warehouses; appearances before regulatory bodies; administration of field bulk and liquid sugar stations; handling of damage and overcharge claims; purchase and/or lease of specialized transportation equipment; maintenance of sound relationships with carriers, warehouses, and all departments and brokers throughout our marketing areas; and continuing research on alternative plans and methods of transportation.

Gerber Products puts the distribution function in its general traffic department, which is part of the company's administrative division. General traffic manager reports directly to the assistant to the president.

Traffic Unit Go-Between

Traffic department, responsible for the physical distribution of merchandise, also sees to it that proper inventories are carried at all locations. Serving as a liaison between the sales and production ends, the department briefs manufacturing on the amount of goods required in line with sales estimates and existing inventories. "Because we have a high percentage of seasonal production," a spokesman explains, "plans are coordinated as much as 6 mos. to 1 yr. ahead."

Where a company sells to distinctively different type outlets, it's often impossible to make one type of program work across the board. At General Mills, for example, each division handles the function its own way. That's because, contends W. K. Smith, automotive fleet manager, "each is operating in a different field with substantially contrasting requirements."

One GM division uses the terms "distribution department" and "distribution manager," he says, "but their responsibilities are, primarily, production planning and inventory control, secondarily, warehousing."

A growing number of outfits slot the distribution head in a top management box. A strong supporter of this trend is Heinz' Ross E. Jones. He argues: "Distribution is a major function today and must be recognized by management as such. Today's distribution manager must operate on the same level of organization as heads of other divisions. He should have first-hand knowledge of company policies and procedures, campaigns being planned, as well as problems encountered by other operating divisions."

Putting distribution on this high level calls for shrewd selection of personnel. "Because the bulk of distribution costs go for transportation," Jones reasons, "management should be careful to select someone with a background in that area. To keep him from becoming narrow-minded, give him assignments in other areas such as warehousing, materials handling, inventory control, production planning, plus whatever will bring him in contact with sales policies and marketing procedures. This way, top management's requirements have a better chance of being carried out."

Keeping Customers Happy

Two words trigger much of distribution management's thinking —customer service. That's because, as Dole Corp. Pres. H. C. Cornuelle aptly observes, "In today's intensely competitive market, food manufacturers must do everything possible to improve service to their customers, by providing better distribution, speeding up paperwork."

Customer service got a big play in Libby, McNeill & Libby's reorganization last Fall. As one spokesman notes: "A key factor is the specialization in the area of customer service. A customer's problems that once required decision by 4 or 5 vice presidents will now be handled by one man, will be acted on faster."

Making your distribution program "customer oriented" is done a variety of ways, as these food company examples show:

► **Pricing can be a form of service.** Thus, Minute Maid's J. E. Melvin explains: "We sell by three basic methods. Customers may buy f.o.b. our Fla. or Calif. production points; we will, if asked, provide transportation and claims service. Customers can also buy in trucks and cars with appropriate volume discounts. Finally, they can buy ex-warehouse from any one of approximately 106 field warehouses. We also maintain a fleet of refrigerated trucks to fill in when customer demands (during peak seasons) exceed the capabilities of common carriers."

► **Shipping aids are another fruitful area.** To help customers order more frequently in smaller volume, Skinner Mfg. Co. works on the railroads to extend transloading privileges as well as grant more liberal stop-over privileges. And C & H Sugar Refining recently provided for truck delivery from rail cars in certain markets where customers were not equipped to handle car unloading. In some areas, the firm negotiated lower rail rates with higher minimums that resulted in lower freight costs to buyers.

► **Billing procedures can be arranged** to enable customers to process invoices faster, qualify more easily for cash discounts.

Recently, Kellogg changed billing date on invoices from day of shipment to day of arrival of merchandise in customer's city. According to Pres. Mard Leaver, of Kellogg Sales Co., "This plan gives all customers, whether they are located nearby or some distance from shipping points, equal period of time to expiration of discount period."

Last month, General Mills made a similar switch, and, in addition, added to each invoice an easy reference due date for cash discount purposes. J. P. McFarland, vice president, says "new procedure offers maximum profit opportunity for all customers on proportionately equal terms."

► **Newly designed shipping cases speed up warehouse handling.** And with the tray-pack method of shelf-stocking gaining favor, manufacturers like Pet Milk, Anna Myers Pure Foods, and Campbell place cutting lines along case bottoms for easier opening, and use the carton's lower lip for selling messages (dressed up in shaded lettering).

► **Faster order processing helps, too.** (Salada-Shirriff-Horsey's Canadian Division recently introduced a 1-part preprinted sales form listing all products, packs, and sizes which required entry only of the customer name, address, and quantity desired. Vice President Donald F. Philp reports three benefits from the innovation: "Considerable time saving by customer and salesmen, minimum possible error in order-taking, and speedy handling by order desk (with very little editing necessary)."

The firm's Horsey Div. uses TWX and Western Union in addition to telephone facilities. This makes it easier for customers to contact the company, especially during emergencies, and enables the company to expedite orders much more readily.

A Florida freezer recently set up a network of teletypes linking brokers, order department, plants, and certain transportation and warehousing companies. Customer requests are promptly shuttled to traffic department to serve as an order form and shipping order.

Gerber Products has speeded up order handling so that all shipments are made within 48 hrs. In a majority of cases, orders go out on the day they're received.

Moving Goods Faster

Realignment of warehouse networks is being carried out at an accelerated pace as food makers remodel pipelines to changing needs of tomorrow's market. Population shifts, concentration of more business in fewer stores, the need for more frequent, faster deliveries to distributors—all these are forcing food makers to scrap sprawling systems of warehouses in favor of multi-function distribution centers.

Typical example is Borden Foods' sweeping revamp of primary and secondary warehouses. This company hopes, eventually, to consolidate 136 secondary warehouses across the country into 14 to 18 major distribution centers.

Each center will carry Borden Foods' complete line, and will comprise two units—distribution warehouse and an electronic data processing control center. Depending upon regional factors, units will operate together from a single location, or separately from within an area. Harrisburg, Pa., warehouse is controlled from Philadelphia, for example, while New York City facility is directed by a center within the warehouse.

Reasons behind the move are explained this way by James Wilson, distribution manager: "With many production plants throughout the country, we've always had problem of getting products from various factories to area warehouses, and, from there, into countless retail outlets. We figure that under the new setup retailers will be able to meet all their needs from a single source somewhere within their own area."

When the full program is completed, Borden hopes to be able to deliver any wholesaler's order inside of 48 hours. Even more important, says R. D. Wooster, executive vice president, "will be the regularity of shipment. A cus-

What the Chains Want

To help you improve your customer service, FE asked National Assn. of Food Chains execs to spell out what retailers look for from food firms. Here's what Clarence G. Adamy, executive vice president, and Wallace N. Flint, vice president, have to say:

Q. What's the current status of the drive to standardize shipping cartons—what roadblocks remain?

A. NAFC committees working with GMA groups have made substantial progress in the way of standardizing sizes, shapes, slack fill, and packing of glass containers to make cartons conform with palletization requirements.

The chief roadblocks: First, agreement on objectives takes a lot of time and coordination, of which there are never enough available. Secondly, this being a dynamic industry, change is always with us. Inevitably, standardization lags a step behind technical developments.

A major standardization project we have currently is a cooperative effort with American Meat Institute. NAFC is surveying its membership to develop recommended standards for meat cartons.

Q. What steps would the chains like to see manufacturers adopt for more efficient, less costly, distribution?

A. Improvements would fall into two categories. In the first one, emphasis must be on the recognition that progress in a dynamic industry requires continuous work because the basic physical set-up with which you are working is constantly changing. Here, you need continuous work on: 1) Adapting the size and shape of cartons to palletized handling in distributors' warehouses. 2) Labeling and coding cartons to speed up selection in the warehouse and record-keeping areas.

In the second category are those improvements being discussed with GMA and individual firms as "high priority" needs for current action. These include: 1) Improved practices in return of "spoils" which involve substantial wastes of time and money. 2) More rapid progress toward open code dating of cartons to simplify problems of rotation of warehouse stocks. 3) Make it possible for distributors' trucks to pick up merchandise at manufacturers' warehouse when vehicles would be returning empty from deliveries to stores located near the warehouse or plant.

Q. With more distributors relying on electronic data processing for ordering merchandise, what effect will this have on manufacturers?

A. Efficiency and flexibility are the keys here. In general, EDP means distributors must be able to depend on manufacturers for faster delivery if the full efficiencies of the system are to be realized.

Q. What are the latest trends in chain warehousing?

A. Corporate chains have traditionally warehoused packaged grocery items. Newest trend is toward warehousing some lines not carried earlier—such as frozen foods. However, this is offset pretty much by the fact that distributor storage space can't increase fast enough to keep pace with the growing volume of, and rapid expansion in number of items added to, this department.

tomer will be assured of delivery on a specific day of the week."

Basic Factors

As Borden sets up each center, price schedules are revised to give buyers greater incentive to blend their needs into one order. This way, they can take advantage of bracket prices for mixed volume rather than buy from individual product prices.

Wilson says that such a centralized warehouse must meet three requirements: 1) large enough to handle the volume of a vast area, 2) be within a reasonable delivery zone for as many buying areas as possible, and 3) be situated near transportation facilities that assure swift movement of goods.

Each control center is headed up by a distribution manager. As he becomes more familiar with customer's needs, Borden hopes that he will eventually translate this knowledge into better delivery service.

One of the first companies to kick off the drive to the new type of distribution centers was Pillsbury. That company's W. H. Gribble, director of distribution, puts heavy stress on the greater efficiencies high speed computers promise for such centers as well as distribution programs in general. New pipeline pattern launched by Pillsbury four years ago focused on four distribution centers in the field—Buffalo, Memphis, Des Plaines, Ill., and San Mateo, Calif.—all hooked up with company's Minneapolis headquarters to control distribution and inventory levels. Last January, Buffalo was eliminated, its operations being consolidated at Des Plaines. The company is weighing further consolidations in this direction.

Pillsbury is making greater use of EDP units to integrate customers' orders with inventories, production schedules, and production lines operations. Gribble places a big stock in the computers because "they're able to operate faster, more accurately, and have greater storage memories." By bringing facts together in much shorter time, they enable management to make better decisions more quickly, will eventually make it possible for management to "examine the total marketing process."

Looking to the future, Gribble says the "principle of remote control of plant warehouses will be-

BUSY ALL WEEK, Mack B and H Models of H. & S., Inc., Jacksonville, Fla., are washed and checked on weekends. This fleet makes as many as ten trips daily to super markets throughout southeastern states. Macks' freedom from downtime is one key reason why H. & S. is almost exclusively Mack equipped.

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come more important." **What he visualizes is continuous automated order flow from control point to warehouse, more mechanization of the loading and unloading process in warehouses, and day-to-day machine analysis of inventory position, product movement, etc.**

Along with carrying out some radical changes in warehouse patterns, Pillsbury is also pushing some bold innovations in warehouse handling. For example, "take-it-or-leave-it" pallets are being used to speed in-and-out loading.

In routing of loads from one warehouse to another, this system has brought significant savings in the form of double productivity, Gribble says. Here, loads are laid in box cars on corrugated pallet sheets that have special lips on them for fork truck handling. Sheet-pallet load can be unloaded from a box car in 3 min. Pillsbury hopes to extend this system to the customer level.

Pipelines innovations are being introduced by public warehouses, too, to maintain their role in the industry's distribution phase. A noteworthy program by De Pue Warehouse, San Francisco, aimed at attacking the nettlesome LTL problem, has helped save grocery manufacturers, $500,000 the past 4 yrs., reports Howard E. Way, Jr., sales-traffic manager.

Working with Grocery Shippers, Inc., a non-profit shippers group, the warehouse consolidates small lot shipments into TL quantities to customers as far as 350 miles away. More than two million pounds of merchandise is consolidated each month, Way says, and savings range from 25% to 90%.

Along with the job of combining loads, De Pue developed a new paper handling system that provides customers with an inventory control check. This control comes as a byproduct of the warehouses' automatic procedure for writing delivery orders.

Way hopes the program will catch on elsewhere so that, in time, a national group of affiliated warehouses can offer food manufacturers planned distribution on a national level. He contends that "solution to the distribution problem is going to have to come about through some effective means of consolidation."

"Our approach is to utilize the public warehouse to handle like traffic moving to like consignees," he reasons. "By building volume in such an operation, it becomes practical to reduce the number of inventory locations and overcome the higher cost of LTL freight through consolidation. By adding a sound data processing program, the public warehouse system can provide the most efficient method of accomplishing this objective. This is the only practical way to get control of the inventory and perform the service required."

Building Blocks for Growth

Efficient distribution management is a necessary foundation for market expansion. For, as pipelines to customers lengthen, failure to lick transportation and warehousing problems can undermine sales growth.

A striking example of how to build company expansion on successful distribution techniques is Sara Lee (sales up from $400,000 to $25 million in 10 yrs.). SL President Charles Lubin started with a single item, fresh cheese cake, sold in one market: Chicago. Later, when outside brokers began clamoring for his product, he began quick freezing it in order to invade distant markets.

Here, he ran up against the costly LTL problem. To get around this, he diversified into additional items so as to be in a position to send out full truckloads, thus take advantage of lower rates. Today, SL still operates 50 of its own routes for fresh cheese cake in Chicagoland.

Beyond this radius, products are shipped frozen via common carrier in mechanically refrigerated trucks (that hold zero degrees) to brokers in every continental state. Expansion was deliberately carried out on an area-by-area basis. For example, Lubin picked a Salt Lake City broker who covers Utah as well as parts of Nevada, Montana, and Arizona. This way, he avoided the tedious details of building expansion on a city-by-city basis.

"Well, Farnsworth, does this cool your enthusiasm for roast eagle?"

Lubin relies exclusively on over-the-road truckers for long distance hauls, says they're cheaper than railroads and provide faster door-to-door service. He admits, though, this has one drawback: You can't be too selective about picking truckers, say, because a key area may be serviced by just one or two carriers.

Warehousing was another problem SL ran up against when it expanded distribution. That's because the company's items fall in the low density category, hence carry higher storage rates than may apply to refrigerated pastry doughs, for example. Lubin figures that in some cases this factor about doubles his distribution costs.

Door-to-Door Deliveries

His solution: Ship direct to chain and co-operative warehouses. Consignments to brokers are immediately redistributed to independents to minimize storage costs. Where SL is forced to warehouse in selected markets, it carries the stocks strictly as a service to key customers.

Because SL plunks a big chunk of its capital on saturation advertising and promotion, it's constantly evaluating shipping and warehousing for further cost reductions. Here, sales and traffic managers cooperate in studying distribution patterns to see where costs can be pruned without hurting customer service.

For example, say 90% of a certain marketing area involves direct shipments. The two men will then seek ways of eliminating the 10% non-direct shipments. So they try to find a bigger distributor who is in a position to supply everybody — big and small customers—with the same kind of service. Or, they may try to pool orders shipped to a certain area for full truck shipments to eliminate costly LTL hauls. (End)

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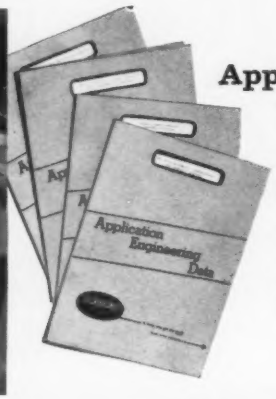

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Marketing Signals

Milkman woos housewives . . . Tray packs not for all . . . Gain for hot vended foods

Foremost Tries Reverse Twist

With the appointment of marketing-minded James Rankin as president, Foremost Dairies is expected to bring some new wrinkles into dairy merchandising. One against-the-trend program reportedly in the planning stage calls for a step-up in the company's retail routes. Noting the success of house-to-house selling in other industries, Rankin is said to feel that the milkman, backed up with a varied assortment of goods, has a market potential that hasn't been tapped yet.

Who Drinks What and When

A national survey of beverage consumption—embracing every age group from youngsters to grandparents—will be launched this month by Market Facts, Chicago market researcher. Covering 13,000 persons in a 4,000-household probability sample, survey will be done semi-annually to allow for seasonal variations. Next phase begins Jan. 1, 1962.

In a corollary development, Florida citrus juice packers are beginning to wonder whether they should shift the emphasis of concentrate promotion from adults to teensters. Martin E. Hearn, Florida Citrus Mutual's director of international trade, raises this point, citing the influence children have on sales of breakfast cereals, candies, and frankfurters. Also, he notes, the under-14-yr.-old group represents about 30% of today's population.

Better Mfr.-Agency Relations

Three guidelines Borden Foods relies on to get the most out of its ad agency are responsibility, information, and communication. So stated Robert E. Kahl, executive vice president, at the mid-year meeting of Grocery Mfrs. of America.

Kahl defines the three factors thusly: **Responsibility**—clear cut understanding as to where it is placed for each step in the development, and execution, of the marketing plan. **Information**—collection and presentation of facts helpful in the development and analysis of marketing plans. **Communication**—keeping those involved up to date on product's status, the overall marketing plan, and how they fit into the master program.

Tray Packs That Won't Work

Not all items lend themselves to the tray pack method of stocking grocery shelves, Curt Kornblau, research director of Super Market Institute, warned at annual meeting of the American Marketing Assn. Product's package type can prevent tray pack display, he noted. He cited breakfast cereals and cake mixes as typical example because they are "susceptible to damage in case cutting." One solution: Tear-strip shippers.

Items with limited turnover are also out. "A product that justifies no more than two facings," he said, "will not automatically get four facings by being delivered in a tray-type carton."

Report on Robot Selling

Hot canned foods continued their fast growth in the automatic merchandising field last year. Number of machines dispensing the items jumped from 19,700 in '59 to 22,900 in '60, reports "Vend" magazine. Soups still dominate—accounting for 60% of the volume. Encouragingly, the magazine notes that toward the year's end, other items were beginning to enlarge their share of sales.

BRIEFS

Helpful data on the sour cream and household cheese markets are included in new reports issued by American Dairy Assn., Chicago.

Condiment meat sauce sales now top $40-million, have shot up 45% in recent years, says Albert Collins, H. J. Heinz product manager.

Meeting retailers' demand for scientific turnover data, Burry Biscuit will provide trade customers with monthly movement analysis of each of its 60 items. Cumulative figures will show rate of progress.

Big-time Better Breakfast drive this year will reach its peak the week of Sept. 10-16, according to Cereal Institute.

Up-to-date profile of Negro market, based on '60 Census, will be available soon from Negro Radio Assn., Charlotte, N. C.

Frozen unbaked fruit pies doubled their volume between '56 and '58, while frozen baked foods increased 24%, asserts Walter G. Bechtel, lab director, American Institute of Baking.

International recipe book helped Kold Kist, Los Angeles, up sales of its frozen prepared foods, according to Merrie Ann Jarvis, ad mgr. Book has been effective in product sampling demos, she adds.

Food Presidents Predict:

Strong Pickup in Second Half

One out of four expects new wage law to spark pay boosts . . . and 39% feel tax incentives may spur modernization

CHIEF EXECUTIVES of food firms are banking on a strong upsurge in the second half of '61 to make up for what they have written off as a less-than-spectacular first half.

Company presidents polled by FOOD Engineering last month said that final returns for the Jan.-June period would show a disappointing 3.3% dropoff in profits despite a 3.6% sales gain. Looking ahead, they estimated that a rising economy could spark a 8.4% pickup in profits and a 5.2% increase in volume in the second half of the year.

Roughly one out of four of the presidents participating in FE's second mid-year survey feels that the new minimum wage law would boost payroll costs. However, a surprisingly strong 39% say that the Administration's proposed tax incentives to spur capital spending could stimulate their modernization programs.

Differences between first- and second-half expectations are pretty spectacular. For example, 42% of the presidents say profits for the first six months will trail last year's rate, but only 4% expect the downtrend to continue in the months ahead. Likewise, as against the 44% who look for fatter margins in the Jan.-June span, 58% feel this way over July-Dec. prospects.

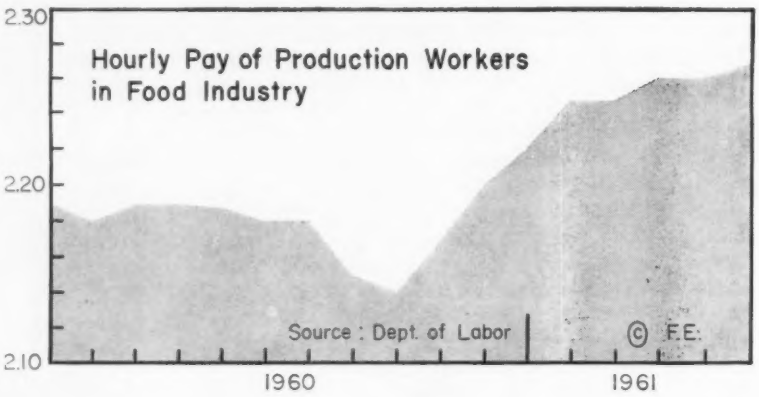
Rough Trail Ahead

Underlying the chief executives' optimistic second half outlook is the expectation that a rising economy will encourage increased consumer spending. Food store sales for the first 5 mos. (unadjusted basis) were a bare 2% ahead of the year-ago period. Furthermore, eating-out volume (always sensitive to unemployment totals) just

THAYER C. TAYLOR
Associate Editor, "Food Engineering"

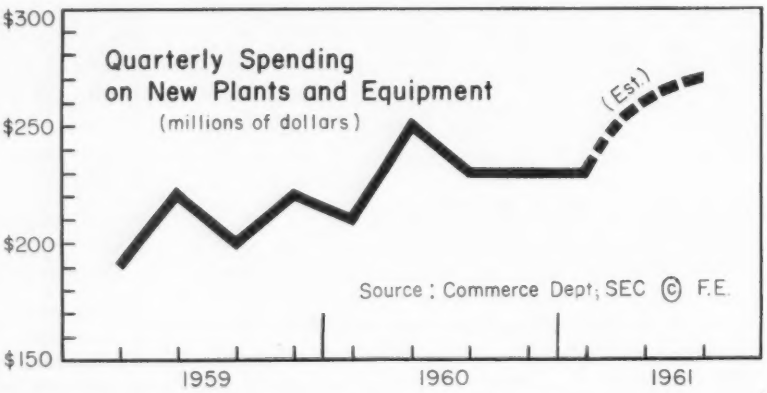
Two New Issues for Company Chiefs

1. Will New Wage Law Trigger Pay Boosts?



HOURLY wage scale is well above the new minimums, but if lower-pay levels are increased unions will try to retain traditional spreads. Hourly rates stack up as follows: Meat, $2.51; beverage, $2.49; sugar, $2.42; grain mill and baked goods, $2.25; dairy, $2.19; miscellaneous, $2.17; canning and confectionery, $1.84.

2. Will Tax Incentives Spur Modernization?



LATEST government survey indicates food-beverage firms will spend $1.1 billion on capital improvements this year vs. $900 million in '60. Check by Federal Reserve Bank of Boston shows food outfits in New England will allocate 82% of spending to new equipment, 18% to plants. To encourage small firms, Administration offers 10% tax credit against first $5,000 of investment.

about held even with comparative '60 levels.

Plainly, the chief executives have a rough job cut out for them if they hope to come up to first-of-the-year predictions of a 5% sales gain. Commerce Dept. data show that, through April, food-beverage manufacturers' business was up only 1.4% over last year's rate.

To hike that rate, food chiefs are banking on new products to stimulate consumer appetites and a fall-off in the unemployment rate to spark heftier eating-out volume.

As chief executives steer their firms into the second half of '61, they have two new issues to ponder—a new minimum wage law and proposed tax incentives for capital spending.

Some 29% told FE that they expect higher payroll costs in the wake of the new wage law. As you would expect, the smaller the company, the more likely it feels this way. Thus, 27% of the companies with an annual volume of $19-million or less figure that their operations would be influenced by the higher minimum; against 18% in the $20 to $49-million range, and 17% in the $50-million-or-over category.

Presently, hourly earnings of food industry production workers average $2.26—more than a dollar above the new minimums. Of course, spread between industry sectors is pretty considerable—from $1.82 in canning and confectionery plants to $2.51 in meat packing units. **It's worth noting that almost half of the presidents who figure the new law will boost costs head up cannery operations.**

Food executives' replies to FE suggest that they are more favorably disposed to Pres. Kennedy's proposed tax incentives than industry in general. Although every business group appearing before the House Ways & Means Committee last month criticized the program, a sizeable 39% of FE's respondents feel that the proposed tax credits could spur their modernization plans. One out of 10 say they are "still studying" the idea, waiting to see what final shape the law takes.

Company size doesn't seem to count for much, here. Outfits in the $20-to $49-million range are evenly split on whether the plan would be of any help, while one out of the three in both the smaller and larger volume groups concede plan has appeal. (End)

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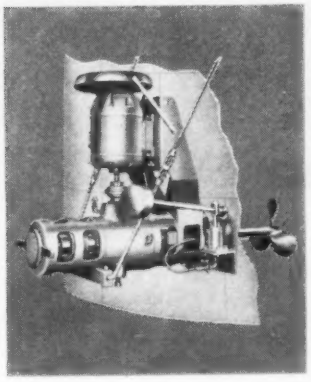

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In Canada: Greey Mixing Equipment Ltd., 100 Miranda Avenue, Toronto 19, Ont.
In Europe: Lightnin Mixers Ltd., Poynton, Cheshire, England

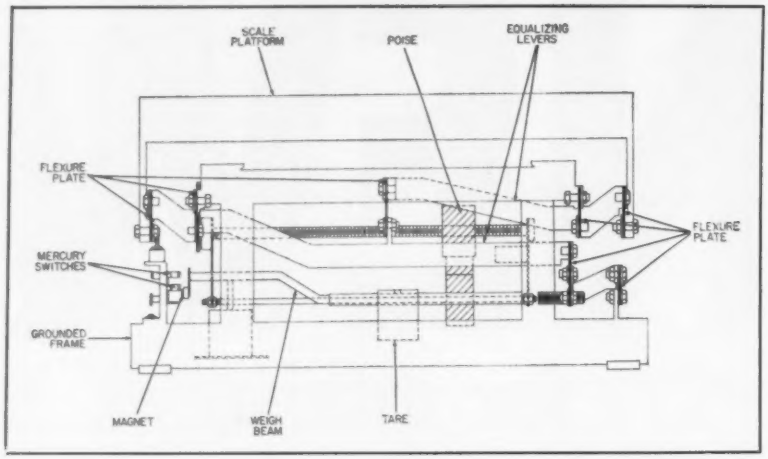


DIAGRAM shows components of Thayer scale installed in apple processing plant. System provides high - speed, continuous flow with automatic weighing.

Weighing the Profits

Shift from batching to continuous flow with high-speed weighing improves quality and yield. Profits rise, too

IN ITS MODERNIZATION program, New England Apple Products Co., Littleton, Mass., a leading producer of apple-based food products, is eliminating all batch processing in favor of high-speed, continuous flow with fully automatic weighing. Result:

- **Plant capacity is up spectacularly.**
- **Work load has evened out.**
- **Space and labor costs have dropped.**
- **Greater accuracy in determining yield provides tighter control of costs and profits.**

Apples delivered by truck, are dumped into bulk bins or stored on pallets in bulk containers. Originally, the apples were pressed in huge hydraulic presses, batch by batch. The pulp had to be removed after each squeezing, while the juice flowed through pipe lines to stations where it was filtered, pasteurized and packed as apple juice, cider or combination juice drinks.

How System Operates

The new system begins in the storage area, where the apples are gravity-fed to a sluiceway. Waterborne, they are simultaneously washed and separated from the leaves, twigs, grass, or other such foreign matter.

High-speed hammer mills crush the apples, and the pulp is then centrifugally pressed — "spin-dried"—by a continuous, axial feeding of the pulp through the spinning sieves.

Normal production rate is approximately 15,000 to 18,000 lb. of apples/hr. From mid-September through November, the plant operates at 1½ or 2 shifts, and may process more than 100 tons/day. This is part of an evening-out process which has greatly reduced the seasonal nature of the business in the last two years. New methods of "controlled atmosphere" storage have greatly extended keeping qualities of the perishable fruit, making it possible to deliver excellent quality apples later in the winter. This "deep sleep" technique is rapidly expanding and will eventually enable the industry to operate on a nearly uniform year-round basis.

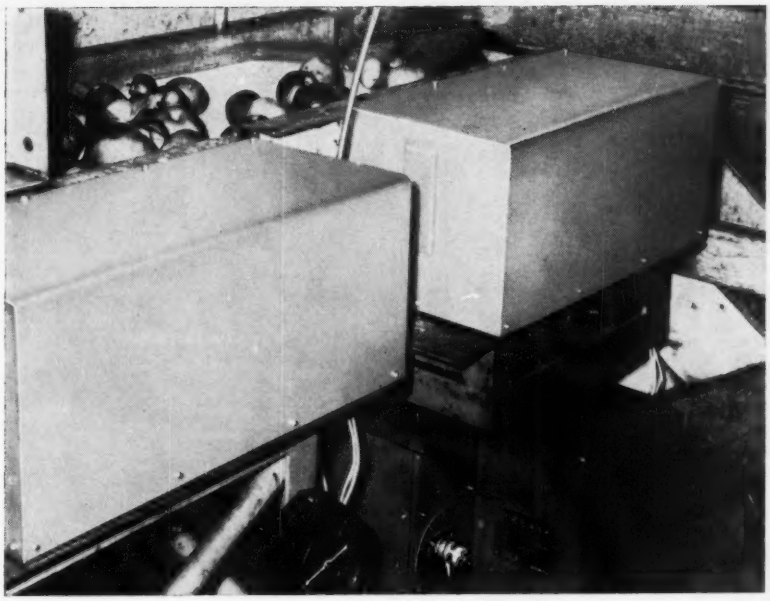
With continuous flow of a large volume of apples through the plant, it was no longer possible to weigh each batch and compare it with the corresponding yield. Further, the receiving area did not lend itself to accurate inventory operations, since it operates on a first-in, first-out basis. Heavy plant demand often drained away supplies at the same time that trucks discharged their deliveries.

Since high volume and narrow margins spell profit, the new continuous flow system, while faster and most efficient, did not provide reliable means for determining the yield. Monthly averaging can be inaccurate with the possibility of a loss situation continuing too long.

What was needed was a continuous weighing system which would provide: A total weight of apples used in any day, and a method of rate control at the weighing station, thereby permitting easy and accurate setting of the entire system. The scale also had to be extremely rugged and trouble-free, since any downtime, especially during the season of peak deliveries, would create storage problems and spoilage of the fruit.

Pneumatic Scale Selected

A Thayer Model T12C suspended-lever pneumatic scale met



WEIGHING UNIT weighs not only the apples being carried across unit on short belt section, but weighs itself at same time. This eliminates inaccuracies such as belt drag, motor torque.

all of these requirements. It also provided a remote readout station where the rate can be read and adjusted, and where a totalizer keeps track of the plant's raw materials consumption, in pounds, on a daily, weekly, or monthly basis. Thayer, a subsidiary of Sundstrand Corporation, provided engineering service on the installation, and calibrated the belt feeds for an initial flow rate of 300 lb./min., which is the average flow rate in the plant. The scale's range is from zero to 500 lb./min. and the weighing area has a deadweight capacity in apples of 22 lb.

One of the outstanding features of the scale is its patented suspended level principle which eliminates all rolling and contact friction. No pivots are used in its construction, the beam motion being transmitted through a flexure plate which provides a weighing mechanism without any wearing parts. This is particularly advantageous in a dynamic weighing system where the scale is in constant motion.

The scale's design permits future elaboration of the overall process-control system. An air output signal proportional to the weight going across the scales can be used to operate mechanisms which control the flow rate of additives such as vitamin concentrates.

Requiring little or no maintenance, the scale permits control of the process to within 1% of the desired flow in terms of lb./unit time. This also means that the total amount of apples used in plant for a given period can be determined to within 1%. Maximum accuracy is achieved at maximum capacity, i.e., when scale is operating close to upper limit with maximum conveyor belt speed. (End)

. . . Now they're trying to sell butter that you can write on !!

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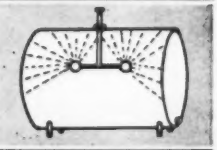
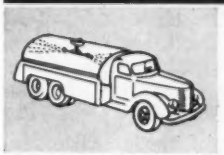


CLEANING AIDS



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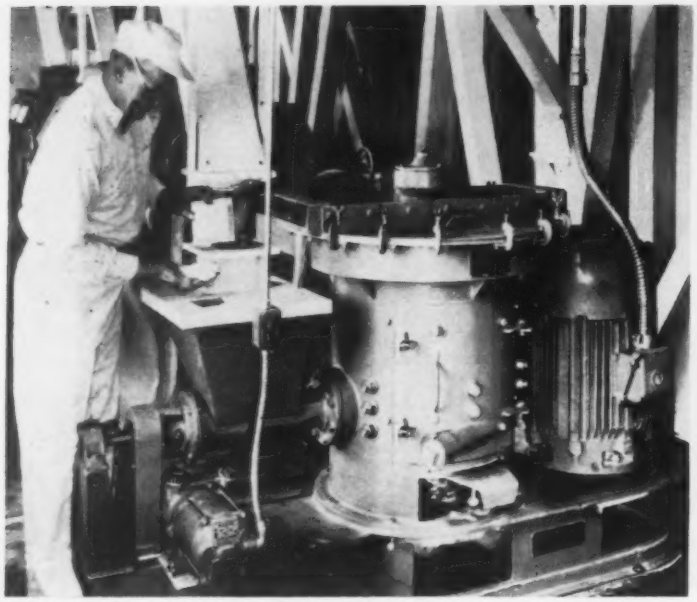
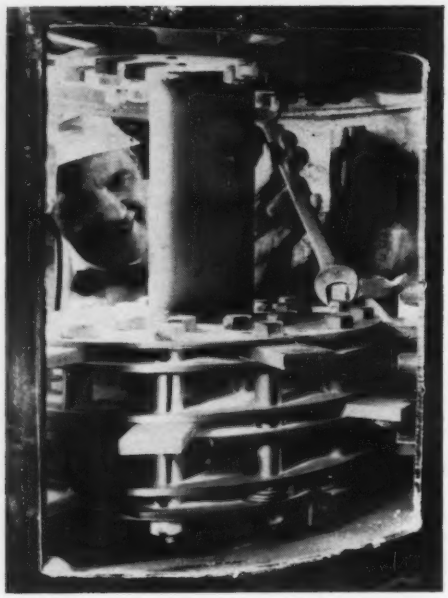


IMPACT MILL eliminates four grain-reduction steps, replaces two roller mills, several elevators, and a sifter at Spangler's Mount Joy, Pa., mill. Similar equipment can handle other grains, also spices and sugar.



INSIDE the mill, three rows of impactors grind the particles as they pass between revolving units and stationary wall impactors (right).

Latest Milling Techniques Make New Production Strides

Impact grinding gives Pennsylvania miller shortest reduction process, ups production 10%. Air classification provides 'starch-protein shifts' . . . Equipment, operations detailed

HOW MODERN impact milling and air classification can also profit the smaller processor has now been clearly demonstrated by Spangler Flour Mills, Inc., Pa. Giant national millers, such as Pillsbury and General Mills, have been using the techniques for some time.

We will detail these processes after a look at two of Spangler's operations.

One is at Mount Joy, Pa. (50-cwt./hr.), where incorporation of impact milling reportedly provides the shortest reduction process on record. The other is at Camp Hill, Pa. (105-cwt./hr)., where air classification provides 'protein shift.' This enables producing flours in three basic protein grades from any single mill stream.

With equipment supplied by Sturtevant Mill Co., Boston, Spangler reports these impressive gains:

. . . **Impact milling at Mount Joy** has upped production 10% and improved flour quality.

. . . **In greatly simplifying the operation**, it has eliminated the second through fifth middling reductions, also replaced two double-stand roller mills, several elevators, and a sifter.

The mill receives the first through fourth breaks redust, all over-11XX from first midds, and over-12XX from sizings. More than 96% flour-grade product is collected in the primary cyclone and secondary filter collector. Compare this with the 70-75% reduction achieved in the best roller-mill operations.

A small percentage of overs—mostly fibre—goes to a tail-end mill formerly used for six midds reduction. Significantly, the yield figure has been reduced from 2.34 to 2.28 on clean wheat.

Because of the new mill's self-classifying feature, product is narrow in predetermined micron range. The endosperm is unchanged in ash content and improved in color. Moreover, vis-

cosity and absorption changes have been beneficial.

The mill is powered by its own 60-hp. motor, and has only four bearings. It does not require regular in-process adjustments, and there is no leather belting to cause maintenance problems.

. . . **Air classification at Camp Hill** provides successful starch-protein shifts in a blend of Pennsylvania Red and New York White wheats. Resultant flours are of high, medium, and low protein content. They also vary in viscosity and absorption properties.

For Spangler, this means less blending-in of higher-cost white wheat with the red to meet customer specifications. And it minimizes the buildup of flours of lesser-demand protein levels.

In operation, the classifier takes a 'standard flour' of five breaks, seven reductions, sizing, and tailing operations. To provide the protein shift, it removes some 8% of the fines, which generally are highest in protein content. Spangler anticipates that eventually 80% of his flour will pass through the unit.

Now, any miller in either a hard or soft wheat area can 'custom tailor' his flour, despite seasonal chemical changes in the wheat.

How Units Operate

A. T. Drake, Manager of Sturtevant's Grain Processing Div. describes both impact milling and air classification as mechanical processes that depend on centrifugal force, specific gravity, particle-size reduction, and air conveying.

In impact milling, flour or other wheat products are fed to the mill by a variable-rate screw. Special vanes create a whirling, vertical flow of air that is drawn through adjustable gates at the bottom. Three-row impactors, like rigid hammers on a hammer mill, crush the material as they pass between and intermesh with stationary wall impactors.

Mounted in vertical positions around the inner wall are special deflectors which create turbulence and deflection of coarser materials back to the grinding zone. A fan, enclosed in a volute casing atop the mill, pulls ground material upward and through pre-set revolving selector arms.

The number of selector arms can be changed to reject oversize material. They act like a classifier in that they make the passage of air-entrained product more or less difficult. Over-size material returns to the grinding zone and does not leave the unit until reduced to a size that permits passing through the selector-arm section.

This does not mean, however, that a large quantity of material is held within the mill because its action is very fast. But it does eliminate the possibility of a small quantity of over-size material remaining in the ground product. Also important is the fact that the mill is air swept, which keeps heat rise almost negligible for most products.

Another advantage is pneumatic conveying of product from the mill. This allows installing the collector at a considerable distance, and eliminates need of conveyors and/or bucket elevators en route to the sifter or classifier.

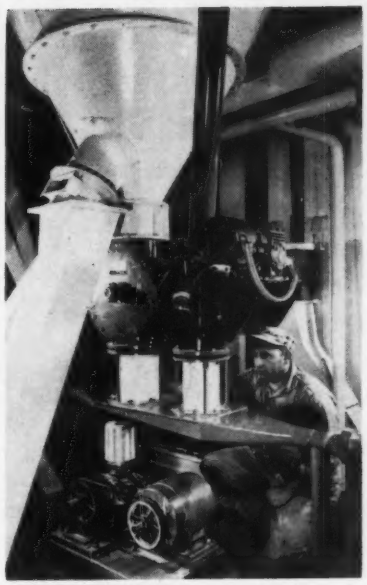
As ground material is constantly entrained in air, there are no dead pockets of material within the unit—very important from the sanitation standpoint. Furthermore, the possibility of any live infestation surviving the action of this mill is extremely remote. Although the machine was not designed as an infestation destroyer, its apparent ability to destroy infestation is noteworthy.

Roller vs. Impact Mill

Although the roller mill has undeniably played a most important role in milling, there is no longer any justification for using it throughout the system.

A roller mill grinds principally by pressure and shear. When operated on very fine stocks, where the rolls are practically running together, its efficiency drops off considerably. These stocks are much more readily reduced on impact-type mills which do not use pressure and shear and, therefore, do not have a tendency to flake or to rupture starch cells.

The point is that the roller mill should no longer be regarded as the sole grinding medium and, instead of a grinder, it should be termed a 'purifier' and 'sizer.' When operated with reasonable tolerance between the rolls, it can very accurately size-reduce a granular product. With products containing fiber in the form of bran coatings, it broadens the fiber while reducing the granular endosperm, thereby making it



'PROTEIN-SHIFTING' air classifier at Spangler's Camp Hill, Pa., mill separates a single flour stream into three different protein grades.

easier for the sifters to reject the elongated, over-size fiber material.

But when forced to grind at very close tolerances between rolls and to produce large quantities of flour from impure endosperm, it creates flakes of endosperm impregnated upon fiber. This calls for repeated operations to assure that flakes do not find their way into the feed bins.

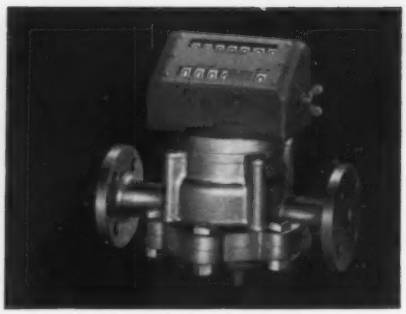
Most flour is bolted through 10's and 11 XX silk cloths. Still there is a large amount of pure endosperm of low ash content that scalps off the next reduction. It merely needs reducing to a smaller particle size to make it suitable for incorporating in the flour streams.

Therefore, instead of sending to the next reduction roll a conglomeration of fine, pure endosperm, and coarser contaminated stock, separation of this material should be made within the sifter. Then the fine, pure endosperm should be consigned to an impact mill for direct reduction to flour.

3-Fraction Separation

Briefly, the classifier uses centrifugal force and material density to oppose the force of controlled air velocities. Amount of separation is controlled by forcing the air and its entrained material to travel a tortuous route, which allows the heavier-density

NIAGARA METERS



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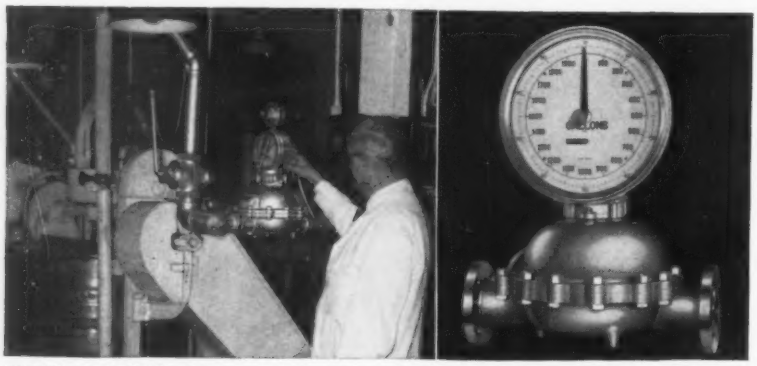

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material to separate from the more easily conveyed, lighter-density particles.

In operation, flour enters the inlet of the classifier through an air-lock and falls through a hollow shaft onto a revolving disk. The latter spreads the material into a thin, whirling veil through which air is drawn upward to a selector section—a round plate upon which is mounted, at its outer periphery, a series of fan blades.

The number of blades can be altered to allow more or less product to be pulled through them and to a fan above. The more blades on the selector, the finer the product allowed to pass through. This selector section, and the number of blades in it, is the most critical design element. It allows the operator to change from a low of 5% fines removal up to and including 90% removal.

Air and entrained product pass on through the eye of the fan, which is adjustable externally, and to the classifier's outer casing. Latter allows the fine fraction to separate from the air and to discharge via an air-lock at the bottom.

To this outer casing is attached a vent pipe, which leads to a filter-type collector maintained under slight suction. By varying the degree of suction of the external dust filter, more or less product can be pulled from the fine section of the classifier. This vent pipe is situated within the vortex of the cyclone casing so as to present to the filter a finer micron-range material than that discharged through the air-lock.

Versatility of this system is significant in view of the wide variety of milling requirements. Some mills are principally cake flour producers. To improve baking properties, they want a finer-ground flour with a small percentage of very high protein removed via air classification. Others wish only to produce cookie and cracker flours on a 50-50 basis, or some similar cut. And they do not wish to retain, as a by-product, a high protein fraction which would present a disposal problem.

Also, in the soft wheat area, there are mills which produce three different grades of flour. Here, the ideal situation would be to produce these flours simultaneously in the required percentages by the three-fraction process, and have them meet all baking requirements without further alteration. (End)

Advances in Technology

Freezing Yeast-Raised and Cake Doughnuts

The American Institute of Baking under contract with U.S.D.A. completed studies to find the best conditions for freezing, defrosting, and frozen storage of doughnuts. Here is a summary:

1. Forced air circulation greatly lowered freezing and defrosting times of both packaged and unwrapped doughnuts at all freezer and defroster temperatures. Air flow rate of 500 linear ft./min. caused the major part of this effect. Higher flow rate (1,000 lin. ft./min. reduced time only a small additional amount.

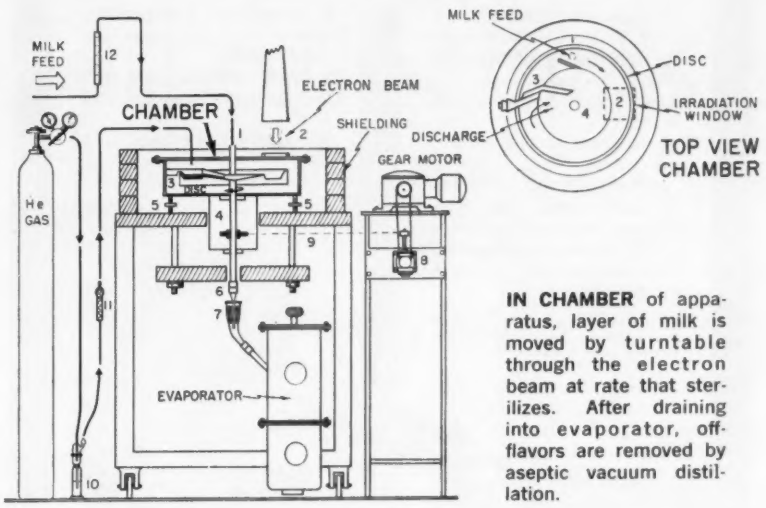
2. Doughnuts froze much more rapidly at —10F. than at 0F. Lowering freezer temp. to —20F. gave a further but small decrease in freezing time.

3. Doughnuts defrosted much more rapidly at 95F. than at 75F. At 115F. defrosting time was lowered further, but by a smaller amount.

4. Moisture loss on freezing unwrapped doughnuts is negligible. Moisture loss during defrosting is rather high. Doughnuts which are frozen unwrapped should be packaged soon after freezing and kept in the package through defrosting cycle.

5. Freezing times from 30 to 105 min. and defrosting times from 30 to 120 min. were used. Within these limits, differences in freezing and defrosting times had little effect on freshness.

6. For both kinds of doughnuts, 0F. is low enough to protect freshness for periods up to at least 56 days. Storage about 0F. is not recommended. — *American Inst. of Baking*, Bull. 99, Mar. 1961.



IN CHAMBER of apparatus, layer of milk is moved by turntable through the electron beam at rate that sterilizes. After draining into evaporator, off-flavors are removed by aseptic vacuum distillation.

Rotary-Disc Apparatus Produces Sterile Irradiated Milk Without Off-Flavor

Radiation sterilization of milk has produced undesirable changes in the milk irradiated. Some of these changes are: Off-flavors, development of gelation, and browning in storage.

An apparatus was constructed that allows production of sterile concentrated (3:1) milk which is essentially free of off-flavors. Polyphosphate-treated milk processed in this manner may be stored at 30C. in sterile form without gelation for at least 6 months.

Factors considered in the design of the apparatus were: Desirability of continuous operation; ease of cleaning and sterilization; prevention of corrosion; penetration of electron beam; and removal of off-flavors. The apparatus consists of three basic parts: 1) an irradiation chamber; 2) an evaporator in which off-flavors are removed by aseptic vacuum distillation and milk diluted to desired concentration; and 3) an aseptic sampler.

The 0.8 Mev energy of electrons produced from a GE accelerator necessitates irradiation of a thin film (2 mm) of milk to obtain a sterilization dose.

It is possible that this apparatus may find practical use in the electron irradiation of other liquids of suitable viscosity.—*Food Technology*, 239-241, May 1961.

Gibberellic Acid Has No Effect on Brewers Yeast

Untreated worts and worts containing from 0.001 ppm. to 10 ppm. gibberellic acid (G.A.) were prepared to study the effect of G.A. on brewers yeast. After nine recycles of the yeast in the treated and untreated worts, the following results were obtained:

1. No difference in fermentation rate.
2. No effect on yeast weight.
3. Flocculation time unchanged.
4. Carbohydrate (sucrose, melibiose, arabinose, rhamnose, xylose, and maltose) fermentability unchanged.
5. Alcohol and potassium nitrate utilization unaffected.
6. Colony and cell morphology unchanged.
7. No consistent difference in normal beer analysis.

—*Paper by Dahlstrom, Gauger, and Martin*, Amer. Soc. of Brewing Chemists Convention, May 1961.

Chemical Changes on Heating Cottonseed Oil

When cottonseed oil was heated at 225C. in the presence of air for long periods of time, nonurea adduct-forming monomers and dimers were formed which were toxis to rats.

Analyses showed that the toxic fractions contained moderate amounts of carbonyl and hydroxyl and that they contained unsaturation difficult to remove by hydro-

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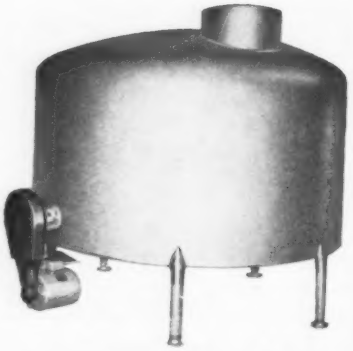

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genation. Cyclic structures appeared to be present in the dimer fraction.

The production of nonurea adducting monomers and dimers is associated with polymerization and other reactions of linoleic acid.—*Jour. of Amer. Oil Chemists*, 253-257, May 1961.

Browning and Flavor in Meat Extracts Studied

When beef muscle is extracted at 0C. with cold water and the extract is dialyzed against water, the diffusate on freeze-drying is obtained as a white, highly hygroscopic powder that turns yellow, or yellowish-brown, at room temperature. Using such extracts, the browning of meat extracts and the development of color and flavor in meat and meat extracts has been studied.

In fresh muscle the reducing substances are diphosphopyridine nucleotide (DPN) and sugar phosphates with glucose in occasional samples. As the muscle ages autolysis takes place. The phosphates are split off leaving the sugars as the reducing substances.

The sugar phosphates as well as glucose can take part in reactions of the Maillard type, and this accounts for the rapid browning of extracts of fresh muscle. There is little doubt that the brown color and meaty flavor that develop in meat extracts is due to a Maillard reaction.

Ribose-5-phosphate seems to be the highly reactive reducing substance that causes the brown color and meaty flavor characteristic of these extracts as the result of a Maillard reaction.—*Jour. of the Science of Food and Agriculture*, 61-69, 12(1), 1961.

Improved Curd-Fusing Machine Proves Successful

An improved version of a curd-fusing machine was tested as a mock-up model. The machine comprises four stages: Screening and drying; compression and flow; guillotining; and holding.

It can successfully cheddar curd made by either the short or the traditional method of manufacture. Cheese of very good quality with all the characteristics of Cheddar cheese was made with the mock-up model. The design of the first commercial model will be based on this experimental machine. — *Australian Jour. of Dairy Technology*, 186-190, Oct.-Dec. 1960.

FDA Specifies Spices, Essential Oils as GRAS

Included in this latest ruling on substances generally recognized as safe are: Other seasonings, oleoresins, and natural extractives

IN AN ORDER published June 10, 1961, "Federal Register," the Commissioner of Food and Drugs has concluded that substances in a specified list of spices, seasonings, essential oils, oleoresins, and natural extractives are safe for their intended use.

This order has been decreed by the Commissioner after having considered all comments filed and all data accumulated with reference to the **proposed order** published in the "Federal Register," May 19, 1960. This proposed order contained the specified list of substances regarded as substances generally recognized as safe within meaning of section 409 of the act.

Here is the list by common names:

(1) Spices and Other Natural Seasonings and Flavorings (Leaves, Roots, Barks, Berries, Etc.)

Alfalfa herb and seed.
Allspice.
Ambrette seed.
Angelica.
Angelica root.
Angelica seed.
Angostura (cusparia bark).
Anise.
Anise, star.
Balm (lemon balm).
Basil, bush.
Basil, sweet.
Bay.
Calendula.
Camomile (chamomile), English or Roman.
Camomile (chamomile), German or Hungarian.
Capers.
Capsicum.
Caraway.
Caraway, black (black cumin).
Cardamom (cardamon).
Cassia, Chinese.
Cassia, Padang or Batavia.
Cassia, Saigon.
Cayenne pepper.
Celery seed.
Chervil.
Chives.
Cinnamon, Ceylon.
Cinnamon, Chinese.
Cinnamon, Saigon.
Clary (clary sage).
Clover.
Cloves.
Coriander.
Cumin (cummin).
Cumin, black (black caraway).
Dill.
Elder flowers.
Fennel, common.
Fennel, sweet (finocchio, Florence fennel).
Fenugreek.
Galanga (galangal).
Garlic.
Geranium.
Ginger.
Glycyrrhiza.
Grains of paradise.
Horehound (hoarhound).
Horseradish.
Hyssop.
Lavender.
Licorice.
Linden flowers.
Mace.
Marigold, pot.
Marjoram, pot.
Marjoram, sweet.
Mustard, black or brown.
Mustard, brown.
Mustard, white or yellow.
Nutmeg.
Oregano (oraganum, Mexican oregano, Mexican sage, origan).
Paprika.
Parsley.
Pepper, black.
Pepper, cayenne.
Pepper, red.
Pepper, white.
Peppermint.
Poppy seed.
Pot marigold.
Pot marjoram.
Rosemary.
Rue.
Saffron.
Sage.
Sage, Greek.
Savory, summer.
Savory, winter.
Sesame.
Spearmint.
Star anise.
Tarragon.
Thyme.
Thyme, wild or creeping.
Turmeric.
Vanilla.
Zedoary.

(2) Essential Oils, Oleoresins (Solvent-Free), and Natural Extractives (Including Distillates)

Alfalfa.
Allspice.
Almond, bitter (free from prussic acid).
Ambrette (seed).
Angelica root.
Angelica seed.
Angelica stem.
Angostura (cusparia bark).
Anise.
Asafetida.
Balm (lemon balm).
Balsam of Peru.
Basil.
Bay leaves.
Bay (myrcia oil).
Bergamot (bergamot orange)
Bitter almond (free from prussic acid).
Bois de rose.
Cacao.
Camomile (chamomile) flowers, Hungarian.
Camomile (chamomile) flowers, Roman or English.
Cananga.
Capsicum.
Caraway.
Cardamom seed (cardamon).
Carob bean.
Carrot.
Cascarilla bark.
Cassia bark, Chinese.
Cassia bark, Padang or Batavia.
Cassia bark, Saigon.
Celery seed.
Cherry, wild, bark.
Chervil.
Chicory.
Cinnamon bark, Ceylon.
Cinnamon bark, Chinese.
Cinnamon bark, Saigon.
Cinnamon leaf, Ceylon.
Cinnamon leaf, Chinese.
Cinnamon leaf, Saigon.
Citronella.
Citrus peels.
Clary (clary sage).
Clove bud.
Clove leaf.
Clove stem.
Clover.
Coca (decocainized).
Coffee.
Cola nut.
Coriander.
Corn silk.
Cumin (cummin).
Curacao orange peel (orange, bitter peel).
Cusparia bark.
Dandelion.
Dandelion root.
Dill.
Dog grass (quackgrass, triticum).
Elder flowers.
Estragole (esdragol, esdragon, tarragon).
Estragon (tarragon).
Fennel, sweet.
Fenugreek.
Galanga (galangal).
Garlic.
Geranium.
Geranium, East Indian.
Geranium, rose.
Ginger.
Glycyrrhiza.
Glycyrrhizin, ammoniated.
Grapefruit.
Guava.
Hickory bark.
Horehound (hoarhound).
Hops.
Horsemint.
Hyssop.
Immortelle.
Jasmine.
Juniper (berries).
Kola nut.
Laurel berries.
Laurel leaves.
Lavender.
Lavender, spike.
Lavandin.
Lemon.
Lemon balm (see balm).
Lemon grass.
Lemon peel.
Licorice.
Lime.
Linden flowers.
Locust bean.
Lupulin.
Mace.
Malt (extract).
Mandarin.
Marjoram, sweet.
Maté.
Melissa (see balm).
Menthol.
Menthyl acetate.
Molasses (extract).
Mustard.
Naringin.
Neroli, bigarade.
Nutmeg.
Onion.
Orange, bitter, flowers.
Orange, bitter, peel.
Orange leaf.
Orange, sweet.
Orange, sweet, flowers.
Orange, sweet, peel.
Origanum.
Palmarosa.
Paprika.
Parsley.
Pepper, black.
Pepper, white.
Peppermint.
Peruvian balsam.
Petitgrain.
Petitgrain lemon.
Petitgrain mandarin or tangerine.
Pimenta.
Pimenta leaf.
Pipsissewa leaves.
Pomegranate.
Prickly ash bark.
Rose absolute.
Rose (otto of roses, attar of roses).
Rose buds.
Rose flowers.
Rose fruit (hips).
Rose geranium.
Rose leaves.
Rosemary.
Rue.
Saffron.
Sage.
Sage, Greek.
Sage, Spanish.
St. John's bread.
Savory, summer.
Savory, winter.
Schinus molle.
Sloe berries (blackthorn berries).
Spearmint.
Spike lavender.
Tamarind.
Tangerine.
Tannic acid.
Tarragon.
Tea.
Thyme.
Thyme, white.
Thyme, wild or creeping.
Triticum (see dog grass).
Tuberose.
Turmeric.
Vanilla.
Violet flowers.
Violet leaves.
Violet leaves absolute.
Wild cherry bark.
Ylang-ylang.
Zedoary bark.

(3) Natural Substances Used in Conjunction With Spices and Other Natural Seasonings and Flavorings

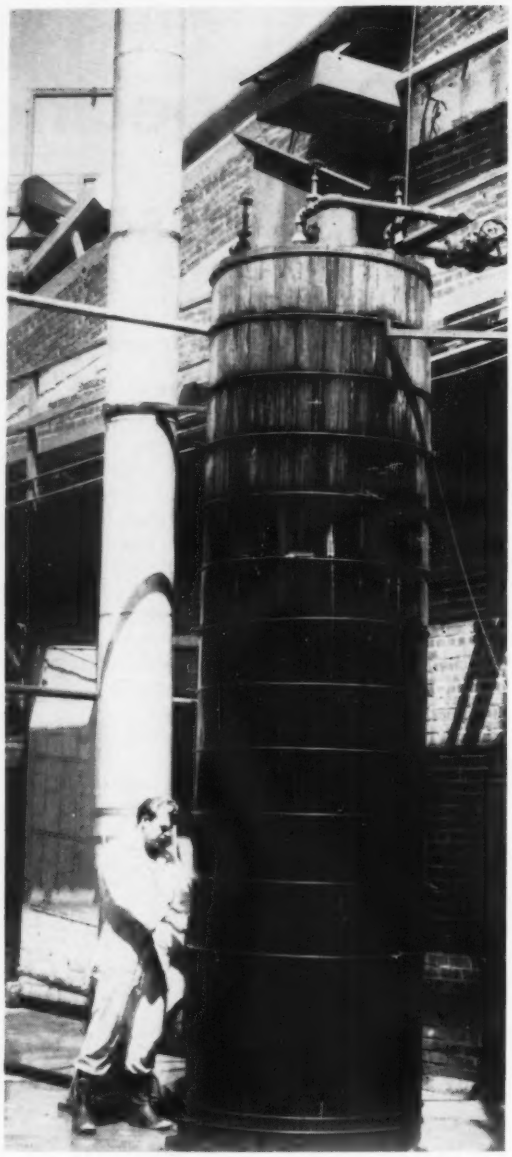
Algae, brown (kelp). Algae, red. Dulse.

(4) Natural Extractives (Solvent-Free) Used in Conjunction With Spices, Seasonings, and Flavorings

Algae, brown.
Algae, red.
Apricot kernel (persic oil).
Dulse.
Kelp (see algae, brown).
Peach kernel (persic oil).
Peanut stearine.
Persic oil (see apricot kernel and peach kernel).
Quince seed.

(5) Miscellaneous

Ambergris.
Castoreum
Civet (zibeth, zibet, zibetum).
Cognac oil, white and green.
Musk (Tonquin musk).



REDWOOD SCRUBBING TOWER cuts the odor level of fish-meal processing gases more than 99%. It uses chemical-treated sea water, has operating costs of a few cents a day.

New Techniques Offer Efficient Odor Control

Mounting pressure on processors to eliminate offensive odors emphasizes the need for economical control. Here are pros and cons of the latest systems.

RECENT SOLUTION of a tough odor-control problem in fish processing has special significance for every food processor.

For this research focuses much needed attention on the growing seriousness of this problem, and pinpoints the various techniques by which control may be achieved.

Undoubtedly, it is only a matter of time before all sources of air pollution come under the jurisdiction of enforcement agencies. And in general, they will impose more stringent controls if pollution has not been checked voluntarily before laws are enacted.

Frequently, 90% reduction of odor will alleviate a nuisance, but legislation may require up to 99% reduction—as was the recent case in Los Angeles.

The Problem in L.A.

In 1959, this country enacted an odor-control ordinance,* which was short and to the point.

It provided that all gases originating from animal-matter-reduction be incinerated at a temperature of 1,200F. for at least 0.3 sec., or otherwise treated in at least as satisfactory a manner before being discharged to the atmosphere.

The law was aimed primarily at meat-packing plants, which didn't find it particularly burdensome because of their relatively small volume of gases to be treated. But it also applied to fish processors—and their problems were vastly greater.

For example, annual gas output of meat packers in Los Angeles is exceeded in only a few days by that of fish-meal processing on Terminal Island. Moreover, incinerating the gases would double the production cost of the meal—which was already being sold at a loss.

Hence it was imperative that

W. H. HUGHES Senior Research Scientist, Western Precipitation, Div., Joy Mfg. Co., L.A.

*"Air Pollution Control District Rule 64: Reduction of Animal Matter."

a solution be found in the escape clause: ". . . or otherwise processed in a manner determined to be equally, or more, effective . . . . " Thus, our company cooperated with the California Fish Canners Assn. and the Los Angeles County Air Pollution Control District to find an acceptable alternate to direct incineration.

How odors are produced during fish-meal production is detailed in the accompanying panel. Suffice it to say they can be more intense and disagreeable than any produced in an edible-food process.

We will range the various control techniques after a look at the scrubbing-tower system, which proved most efficient in our work.

99% Odor Removal

Ordinary sea-water plus chemicals are used in the tower (photo). At the sea-coast, the only cost of sea-water is that of pumping it. And this was minimized by designing the tower to use low-pressure sprays. Furthermore, use of large-diameter lines enabled supplying the required 150-200 gpm. with low power consumption.

Salt-water-compatible components were used throughout the system, and some consideration to compatibility with reactive chemicals was necessary. Fortunately, low concentrations of chemicals do the job.

Because of low pressure in the salt-water lines and a maximum sea-water temperature of 70F., we could eliminate any corrosion problem by use of inexpensive plastic pipe. This proved important because the installation was several hundred feet from the docks.

The tower is of redwood, which is unaffected by salt water, but does impose limitations on allowable concentrations of acids and de-lignifying agents, such as sulfites.

Economy of this technique depends on availability of sea-water at the plant. Chances are that it is either not available at your plant or the cost of obtaining it is prohibitive. Thus, here are other control techniques which may be more feasible for you.

A new development is our company's device called the Arenatherm Reactor, which combines a catalytic afterburner and two heat exchangers. This device is still in the pilot stage, but gives every indication of performing with reliability and economy.

It has the additional advantage of occupying very little space, which allows easy installation in existing plants without disrupting operations. And it is competitive with scrubbers in installation and operating costs.

Other Control Techniques

► **Recirculation:** Where products are dried, partial control may be accomplished by recirculating some of the dryer off-gases through the dryer as quench air. Within limits, recirculation offers a small increase in dryer efficiency because lost sensible heat is more than compensated for by increased dryer inlet-gas temperature. The technique reduces the volume of off-gases without increasing their intensity, and thus reduces total odor emitted to the atmosphere.

Where legislation is more concerned with odor-intensity control rather than odor control, such efforts could prove useless. However, recirculation frequently is of great value in combination with other techniques, such as scrubbing.

► **Scrubbing:** Although requiring considerable water, a properly designed scrubber can achieve 90% reduction in odor intensity and a 15-20% reduction in gas volume. Thus, some 92% reduction of total odor can be obtained by scrubbing alone. However, scrubbing is not as simple as might appear at first glance. It takes competent engineering to produce these results.

► **Incineration:** Equipment required for this excellent method is not expensive, but operating cost is. The key to successful incineration is surface contact. Latter may occur on burning carbon particles from a luminous flame, but it is far better to use an incandescent checker-work. Hot fluidized beds and hot pebble-beds are also very good.

A certain retention time is valuable to allow the gas to reach uniform temperature before discharge. Temperatures ranging 1,000-1,500F. are required, depending on nature of the gases, the incinerator, and the amount of odor reduction required. Operating costs range $80/day.

However, incineration can become competitive with other methods if suitable catalysts are used. A typical catalytic bed operates at about 700F., which permits some 50% reduction in fuel consumption in the above example.

Recuperation methods can cut the cost of incineration as much as 90%, but with greatly increased capital expenditure. A reasonable approach is to use the 1,200F. exhaust gases to operate a waste heat boiler to provide the process steam required in a canning operation.

► **Chemical Treatment:** By careful application of chemical-engineering principles, chlorination and scrubbing have proved to be an excellent tool. In particular, the Western Precipitation process can reduce odor levels by more

Re Fish Odors

They stem from three reduction processes:

THE FIRST is concentration of solubles. Odors originate from dissolution of fish products, principally the soft tissues, by either heat and acid or bacterial action.

Both processes release gases, bacterial action producing the higher volume of more intense and much more disagreeable odors. Total gas volume in either case is not large at this stage.

THE SECOND reduction process is cooking and pressing of fish scrap prior to drying.

Cookers and presses may be controlled by condensing the steam they emit and leading the non-condensables to the primary combustion air inlet of the dryer. The remainder of the primary air may be drawn in through hoods over lifts and conveyors used to transport hot, steaming fish and press-cake.

Since total volume of primary air ranges 2,100 cfm. in a typical 20-ton dryer, efficient hood design is essential.

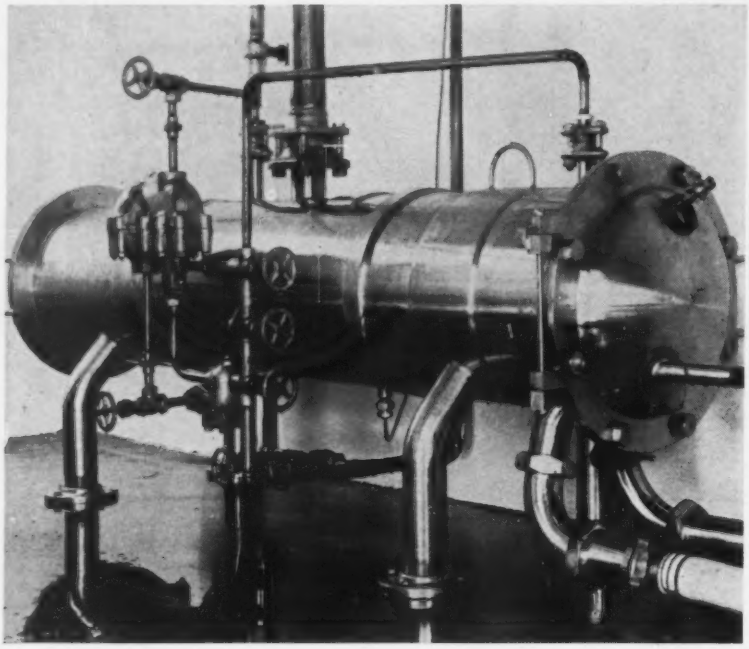
THE THIRD reduction process —drying to produce fish meal— is by far the most important source of odor.

Typical odor levels of dryer off-gases may be defined by stating that they require approximately 5000:1 dilution with clean air to extinguish the odor for 50% of a typical group of normal individuals. Some people can detect the odors when diluted more than 50:1 or 100:1.

Volume of gas from a normal 20-ton. direct-fired dryer is about 25,000 cfm., which contains a large amount of total odor. Odor units are defined as the product of the number of dilutions to extinction for 50% of a test panel, times the number of cubic feet of gas. A typical drying operation emits 125 million odor units /min.

This is one of the largest odor-producing operations known.

FLUIDICS* AT WORK



What to look for in a sanitary heat exchanger

This is a polished, stainless Pfaudler® beer cooler. It handles 140 barrels per hour and requires no insulation, since it is located in a refrigerated room.

Which illustrates two of the three things to look for when you need a sanitary heat exchanger.

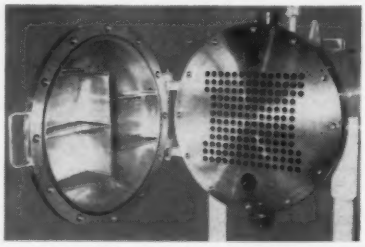
First, consider material of construction. The trend is to stainless steel, with good reasons. You don't have to worry about product contamination. You do have good corrosion resistance, long service life, and a hard, smooth surface that's suited to clean-in-place methods.

Second, note how Pfaudler designs and builds to meet individual process requirements. For example, you could get a beer cooler to handle up to 500 barrels an hour. You tell us product, temperatures, and environmental conditions. We deliver a unit that gives you maximum performance in terms of operating efficiency, space, and cost.

Third, look at the sanitation features. Hinged heads for quick cleaning. A #4 finish, so there are no rough spots for particles to lodge in. Coved corners, one-piece gaskets—all the important details are worked into every unit.

And, finally, excellent workmanship and performance are hallmarks of Pfaudler sanitary heat exchangers. Additional reasons why you find them in such wide use and why so many users are "repeat" customers.

More facts? Bulletin 949 covers our general line of heat exchangers to which sanitary features are added. Also available, a monograph entitled "Economics of Beer and Wort Cooling." For copies, or answers to specific questions, write to: Pfaudler Division, Dept. FE-71, Rochester 3, N. Y.



Hinged head in this Pfaudler sanitary heat exchanger can be easily opened for cleaning without disturbing the piping connections.

*FLUIDICS is the Pfaudler Permutit program that integrates knowledge, equipment and experience in solving problems involving fluids.

PFAUDLER PERMUTIT INC.

Specialists in FLUIDICS...the science of fluid processes

than 99% with operating costs of only a few cents a day.

In addition to chlorine, ozone and chloric oxide give good results. Ozone alone can reduce odor intensity as much as 50%. Chloric oxide is an old stand-by for difficult odor problems, but is dangerous to handle and must be produced in situ.

Scrubbing with acids is an effective treatment, but requires that attention be paid to interphase chemical reactions. Success of the treatment rests with the reactive nature of odor-causing materials, which frequently are amines.

► **Precipitation:** Electrical precipitation is effective, but requires low-velocity equipment. This is because odors to be controlled exist as condensation hulls on ultafines which are difficult to precipitate, but impossible to remove in any other practical fashion.

There are several problems in using precipitation. Cleaning is one of them, but the main drawback is expense. Initial cost is very high, although operating expense is negligible.

► **Masking:** Aromatic chemicals, such as perfumes, have been employed with limited success. This has not been acceptable to most air-pollution authorities because they have found no way to distinguish between an agreeable odor and a disagreeable one.

Our experience indicates that masking can certainly be effective in the plant for short periods of time. On long exposure the method is less acceptable and somewhat expensive.

► **Combinations:** Various combinations of the above methods provide flexible control. Typically, each plant has its own solution which depends upon geography, economics, plant layout, and what is acceptable to local authorities.

Each method varies widely in capital cost and operating expense. For instance, incineration has the lowest capital cost for the degree of control offered, but a very high operating cost. Precipitation has a very high capital cost, but negligible operating expense. The former method would be suitable for a dryer operated only an hour or two per week to dispose of otherwise hard-to-handle scrap. The latter would be suitable only for an installation operated round the clock in an area where the abundance of water required for scrubbing would create difficulties. (End)

CIRCLE 84 ON INQUIRY CARD

CIRCLE 85 ON INQUIRY CARD ➔

SPICE IS SPICE ...BUT

STANGE

makes seasoning a science

The ability to create and produce a seasoning to meet your exact needs, plus the assurance that it is in compliance with Food Additive Laws—*IS A SCIENCE AT STANGE.*

The ability and versatility to produce seasonings such as Soluble, Liquid, 50-A Microground® and Ground for all types of finished products *IS A SCIENCE AT STANGE.*

The technical skill to control the flavor potency of each and every shipment to precise specifications—*IS A SCIENCE AT STANGE.*

The talent to create . . . the skill to produce . . . and the flexibility to fit your needs—*IS THE MOTTO AT STANGE.*

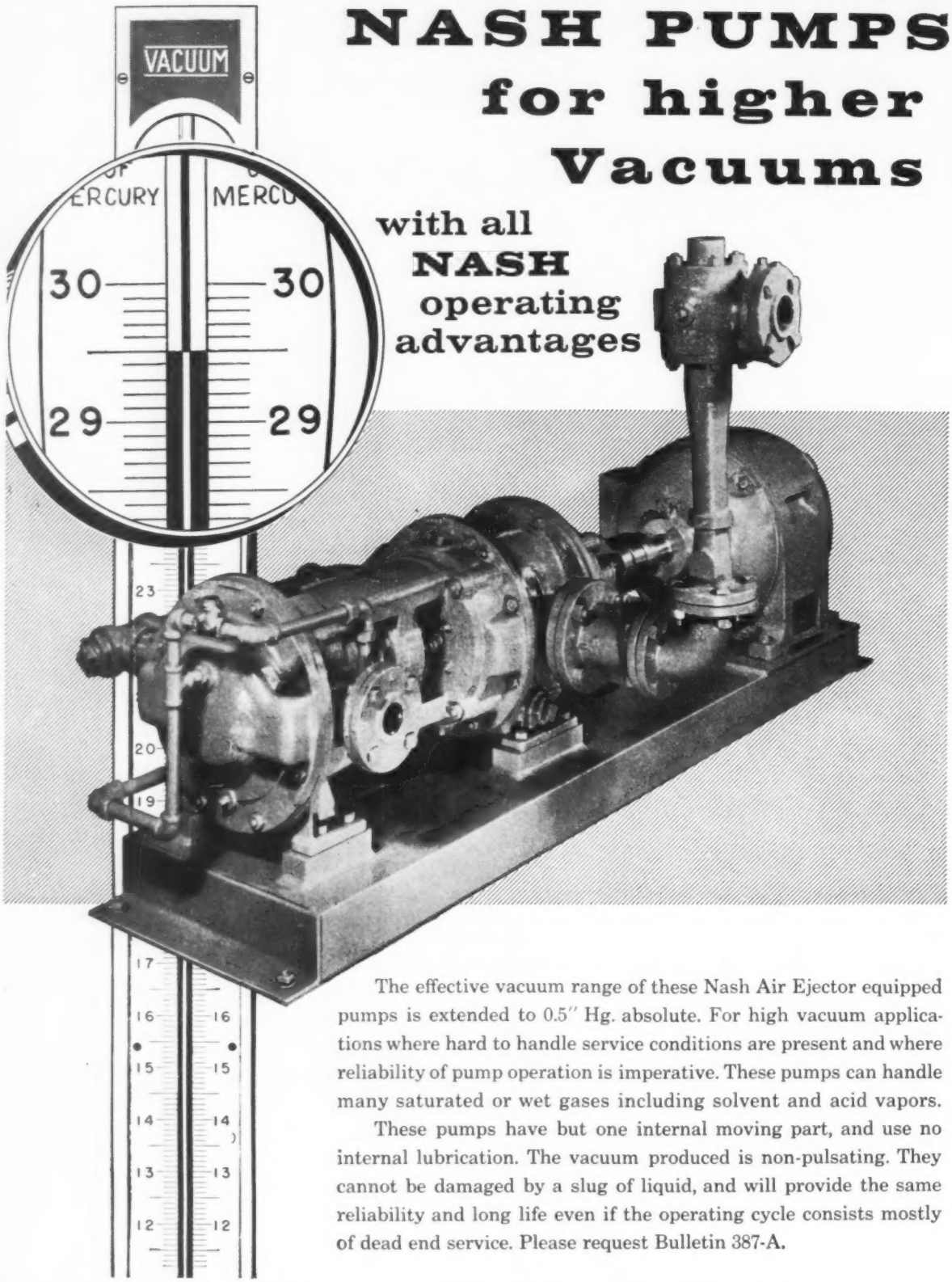
WM. J. STANGE CO., Chicago 12, Ill.
Paterson 4, N. J.—Oakland 21, Calif.
Canada: Stange-Pemberton, Ltd., Toronto, Ont.
Mexico: Stange-Pesa, S. A., Mexico City

50-A Microground Spice® NDGA Antioxidant® Ground Spice
Cream of Spice Soluble Seasoning®
Peacock Brand Certified Food Color®

PRINTED IN U.S.A.

NASH PUMPS for higher Vacuums

with all NASH operating advantages



The effective vacuum range of these Nash Air Ejector equipped pumps is extended to 0.5″ Hg. absolute. For high vacuum applications where hard to handle service conditions are present and where reliability of pump operation is imperative. These pumps can handle many saturated or wet gases including solvent and acid vapors.

These pumps have but one internal moving part, and use no internal lubrication. The vacuum produced is non-pulsating. They cannot be damaged by a slug of liquid, and will provide the same reliability and long life even if the operating cycle consists mostly of dead end service. Please request Bulletin 387-A.

NASH ENGINEERING COMPANY

SOUTH NORWALK, CONNECTICUT, U. S. A.

GERBER PILOTS check flight schedules for firm's two twin-engine planes as mechanic refuels "Sky Baby IV." Pilots, crew, hangar, and other facilities are maintained by Gerber.

Company Planes Pay Off

Top executives at Gerber are whisked to destinations via company-owned aircraft. Cite efficiency and sales hikes

MORE EFFICIENT SERVICE, plus increased sales volume and potential, are attributed to the use of business aircraft by Dan Gerber, president of Gerber Products Co.

Baby food firm, based in Fremont, Mich., has found it both essential and convenient to take to the air in company-owned planes. Moreover, Gerber feels the business plane has become a necessity if the company is to continue its standard of service to an ever-growing list of customers.

Pres. Gerber reports that "Nearly all of our executive personnel in marketing, engineering, production, research, and general administrative functions are passengers in the two Aero Commanders. We have found aircraft transportation to be very useful during periods of plant expansion, for surveys of new areas, construction of new facilities, and development of new operations."

Location a Factor

Location and nature of Gerber's business virtually demands the use of company-owned airplanes. Fremont is about 150 air miles from Chicago or Detroit where most Gerber executives must make commercial connections.

The two twin-engine planes do not normally carry cargo. But, on several occasions, they have been used to transport repair or replacement parts where delay would have been extremely costly. During a recent pea harvest, a viner repair part was needed. The part was picked up and flown to the viner at Fremont and the equipment was back in operation within five hours. Savings in time and money were substantial.

Planes operate out of Fremont Municipal Airport which has paved runways and lighted strips. Gerber, itself, maintains complete service facilities, parts, maintenance tools and equipment. Company has its own hangar and stocks one spare engine. Complete overhauls have been done by firm's own personnel since the beginning of Gerber's aircraft operation.

Fully trained personnel include two pilots, a chief mechanic, mechanic's helper, and a third pilot who also doubles as a mechanic. The men perform all maintenance, 50- and 100-hr. inspections, as well as engine overhaul.

Chief Pilot C. A. Childs reports cost of operating the two planes is $132.16/hr. This includes all operating and fixed costs, including salaries and wages, depreciation on aircraft, hangars and maintenance facilities, insurance, licenses and permits, maintenance and repairs to equipment and buildings, electricity, telephone, heat, and miscellaneous supplies.

Pres. Gerber says his firm measures the plane's worth "like we do any tool of business. They are considered a piece of equipment just as a desk, typewriter, or other plant machinery. These planes add to the profit of our company and, as long as it stays that way, we'll keep on flying."

(End)

EMERGENCY CARGO can also travel by company plane. Repair parts have been shipped to various Gerber plants when extensive delays might have meant serious losses in time and money.

Newly derived method of calculation can assist plant engineers to compute exhaust fan capacities by . . .

Determining Volumes of Escaping Vapors

Chip-Fryer Calculations Have Other Applications

Basic methods followed here in the calculations for a chip-fryer exhaust apply to many other moisture removal operations in food processing. The quantity of steam released, or amount of vapor, is determined from the amount of water removed from the product—both the water in the product and any that might be adhering to it.

When steam or vapor comes off the process through room air, the quantity of entrained air can be determined from the change in heat content of the steam as cooled by the air.

The total amount of exhaust is then equal to the sum of the steam from the process and the air entrained in the steam.

STEAM and non-condensible vapors evolved from the kettles of potato chip fryers must be vented from the fryer hood and out of the building. Some installations utilize an exhaust fan. Others depend on the stack effect due to the temperature differential in the height of the vent stack—sometimes called gravity exhaust system.

Insufficient exhaust can result in steam and vapor escaping into the frying room. This may contribute to employees' discomfort and add to the ventilating load of the fryer room itself.

Excessive exhausting unnecessarily induces large quantities of air at fryer room temperatures into the hood space and over the surface of the hot frying medium. Such excessive air in the presence of moisture hastens the deterioration of the cooking medium, that is, shortens the frying life of the oil. It can also adversely affect chip quality.

The difference between insufficient and excessive exhaust is quite narrow. The vagaries of atmospheric conditions make the gravity system unreliable. An exhaust fan is recommended to insure positive control of optimum exhaust rates. The problem then becomes one of determining the proper exhaust fan capacity for any given frying rate.

The capacity of the exhaust fan must equal the volume of the steam released in the frying process plus the volume of entrained air which leaks into the fryer hood from the frying room. The quantity of steam to be exhausted can be readily calculated; but determining the quantity of entrained air becomes a more difficult procedure. The following method was derived to assist architects and designers in computing fan capacities.

J. L. NEWCOMER
Consulting Engineer, East Lansing, Mich.

Solving Chip-Frying Problem

In the process of frying potato chips, moisture contained in the raw potato is released in the form of steam. The temperature of the steam immediately upon emergence from the hot oil is the same temperature as that of the oil. Since chip frying is accomplished at atmospheric pressures but at a temperature greater than 212F., the escaping steam exists in a super-heated state.

The steam is vented from the fryer hood by way of a stack through the roof. The hood over the frying kettle is open at one end to permit the entrance of raw potatoes, and at the other end to discharge the chips. Both openings permit room air to enter the hood, and become mixed with the steam escaping up the vent stack. The temperature of the entrained air, being less than the temperature of the superheated steam, reduces the temperature of the mixture.

PROBLEM: Determine the total volume of vapors (steam plus entrained air) to be vented from the fryer kettle.

SOLUTION involves two steps, namely: (a) Determining the volume of steam; (b) determining the volume of entrained air. The sum of these two yields the total volume to be handled by the exhaust fan.

Step 1. Determining Volume of Steam

The steam released from chip frying arises from two sources: 1) The bound water contained within the raw potato; and 2) the tramp water adhering to the surfaces of the raw slices.

The moisture release rate for the bound water is determined by multiplying the chip frying rate by the percent change in moisture content between the raw potato and finished chip. The moisture release rate for the tramp water is determined by multiplying the frying rate by the percent of tramp moisture. The total steam release rate is the sum of the above two rates, and is expressed as follows:

$$W_s = F\,(A - B) + F\,(C) \quad \text{Eqn. (1)}$$

$$\text{or } W_s = F\,(A - B + C) \quad \text{Eqn. (2)}$$

where:

W_s = Steam release rate (lbs./hr.)
F = Frying rate (lbs. raw potatoes /hr.)
A = Moisture content of raw potatoes (%)
B = Moisture content of finished chips (%)
C = Tramp moistures (%)

Since exhaust fans are rated in volume rates instead of weight

rates, it is necessary to convert the foregoing answer from lbs./hr. to cu. ft./hr. as follows:

$$V_s = W_s \times S \qquad \text{Eqn. (3)}$$

where:

V_s = Steam release rate (cu. ft./hr.)
S = Specific volume of steam at the exhaust stack temp. (cu. ft./lb.)

Combining Equations (2) and (3), the steam release rate formula becomes:

$$V_s = S \times F\,(A - B + C) \qquad \text{Eqn. (4)}$$

Step 2. Determining Volume Of Entrained Air

A known quantity of steam (W_s) at the temperature of the frying medium (T_3) is cooled to stack temperature (T_2) by an **unknown** quantity (W_a) of room air entering the hood at room temperature (T) and becoming heated to the stack temperature (T_2). Find the quantity of air (W_a) entrained in the steam.

. . . Solution. The change in the heat content of the steam when cooled from (T_3) to (T_2) is equal to the change of heat content of the entrained air when heated from (T) to (T_2). This equality is represented by the following formula:

$$W_s\,(H_3 - H_2) = W_a\,(T_2 - T)\,C_p \qquad \text{Eqn. (5)}$$

Solve equation (5) for W_a

$$W_a = \frac{W_s\,(H_3 - H_2)}{(T_2 - T)\,C_p} \qquad \text{Eqn. (6)}$$

Since the volumes of vapors are required instead of the weights, it becomes necessary to convert the above determined value for W_a in pounds of air/hr. to V_a in cu. ft. of air/hr. as follows:

$$V_a = \frac{W_a}{D} \qquad \text{Eqn. (7)}$$

Substituting the expression for W_a shown in Equation (6), Equation (7) becomes:

$$V_a = \frac{W_s\,(H_3 - H_2)}{D\,(T_2 - T)\,C_p} \qquad \text{Eqn. (8)}$$

Substituting the expression for W_s shown in Equation (2), Equation (8) becomes:

$$V_a = \frac{F\,(A - B + C)\,(H_3 - H_2)}{D\,(T_2 - T)\,C_p} \qquad \text{Eqn. (9)}$$

where:

T = Temp. of room air entering fryer hood (F.)
T_3 = Temp. of frying medium (F.)
T_2 = Temp. of vapors escaping up vent stack (F.)
H_3 = Heat content of steam at temp. T_3 (BTU/lb.)
H_2 = Heat content of steam at temp. T_2 (BTU/lb.)
W_a = Quantity of entrained air (lbs./hr.)
D = Density of air at T_2 (lbs./cu. ft.)
C_p = Specific heat of air at T_2 (BTU/lb./F.)
V_a = The volume of entrained air escaping up vent stack at T_2 (cu. ft./hr.)

Step 3. Total Volume of Vapors Released from A Potato Chip Fryer

The total volume of vapors is the sum of the volume of steam determined in Step 1, and the volume of entrained air determined in Step 2.

$$V_t = V_s + V_a \qquad \text{Eqn. (10)}$$

Sample Calculation

Assume:

Frying capacity (F) = 1000 lbs. raw potatoes/hr.
Moisture content of raw potato (A) = 85%
Moisture content of finished ship (B) = 3%
Tramp moisture (C) = 3%
Temp. of frying medium T_3 = 340F.
Temp. of room air T = 90 F.
Temp. of escaping vapors (stack temp.) T_2 = 230 F.

Solution:

Step 1. Volume of Escaping Steam

$$V_s = S \times F\,(A - B + C) \qquad \text{Eqn. (4)}$$
$$= S \times 1000\,(85\% - 3\% + 3\%)$$
$$= 850 \times S$$

From engineering handbook, (S)—the specific volume of steam at a stack temp. T_2 of 230 F.—is found to be 27 cu. ft./lb.

$$V_s = 850 \times 27 = 22{,}950 \text{ cu. ft./ hr. @ 230 F.}$$

Step 2. Volume of Entrained Air

$$V_a = \frac{F\,(A - B + C)}{D}\,\frac{(H_3 - H_2)}{(T_2 - T)\,C_p} \qquad \text{Eqn. (9)}$$
$$= \frac{1000\,(85 - 3 + 3)}{D}\,\frac{(H_3 - H_2)}{(230 - 90)\,C_p}$$
$$= \frac{850\,(H_3 - H_2)}{140 \times D \times C_p} \qquad \text{Eqn. (11)}$$

From engineering handbooks the values of the above quantities are found to be:

H_3 = 1212 BTU/lb.
H_2 = 1160 BTU/lb.
D = 0.0575 lbs./cu. ft.
C_p = 0.24

Substituting these values into equation (11)

$$V_a = \frac{850\,(1212 - 1160)}{140 \times 0.0575 \times 0.24}$$
$$= 22{,}880.0 \text{ cu. ft./hr. @ 230 F.}$$

Step 3. Total Volume of Vapors

$$V_t = V_s + V_a \qquad \text{Eqn. (10)}$$
$$= 22{,}950 + 22{,}880$$
$$= 45{,}830 \text{ cfh @ 230 F.}$$
$$= 763.83 \text{ cfm @ 230 F.}$$

(End)

Meets AFDOUS standards. Keeps 1500 lbs. or 39 cu. ft. frozen for hours, from storage to retailer, without refrigeration or dry ice.

Easy to handle. Lifts with handjack or forktruck. **Rugged construction.** Steel, aluminum, foamed-in-place polyurethane insulation. 40" x 40" x 65".

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Firm_____
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Men & Companies

Dr. C. Glen King

Nutrition Foundation Expands . . . Dr. C. Glen King, former executive director, has been appointed president of The Nutrition Foundation as part of an accelerated expansion program. To permit this, Charles G. Mortimer, chairman of General Foods Corp., who has been president, assumes the title of executive committee chairman, and Daniel F. Gerber, president of Gerber Products Co., who has been v.-p., becomes executive committee vice-chairman.

Dr. James R. Killian, Jr., board chairman at M.I.T. and chairman of the Foundation's board, plans further administrative changes and staff expansion to implement a broadened public service program. This includes an information campaign to bring knowledge of sound nutrition practices to the public in lay terms as well as extending the research and scientific education it has sponsored since '41.

William C. Durkee

Pepsi's Senior V.-P. . . . William C. Durkee takes over as senior v.-p. of Pepsi-Cola Co. and remains in charge of the company's Marketing Div. In this capacity Mr. Durkee is responsible for all functions and personnel concerned with the manufacture and sale of Pepsi products through its nation-wide bottler organizations.

These functions include sales, advertising, equipment development, market research, syrup sales, promotion, training, new products, new markets, product control, plant engineering, and the field marketing organization, all representing Pepsi's total marketing effort.

Mr. Durkee has been marketing v.-p. since '58. From '55 to '58 he was v.-p. and manager of company's Central Div.

Other recent appointments within the firm include **Stephan Addison Schoff** who moves up to director of personnel for Pepsi-Cola International, and **Harold E. Rome**, who takes over as company secretary.

Gordon Edwards

Kraft Ups Edwards . . . Gordon Edwards has been appointed executive v.-p. of Kraft Foods Div. of National Dairy Products. He will be succeeded in his former post as financial v.-p. by Benjamin J. Keiley.

Mr. Edwards joined National Dairy as an employee of Chevy Chase Dairy in Washington, D. C. and in '35 was transferred to headquarters in NYC. A year later he was appointed controller of Midwestern Div. and in '49 became assistant treasurer and budget director of Kraft Div. followed by appointment as treasurer, a director, and in '56, financial v.-p.

Mr Keiley joined Kraft in Atlanta, Ga. and rose to the post of controller of the company's Southeastern Div. In '57 he was appointed controller of Kraft's international headquarters in Chicago.

Personnel

Frank J. Delaney, Jr., Midwest Biscuit Co., has been reelected president of Biscuit & Cracker Manufacturers Assn.

Dudley G. Seay, president of Basic Products Corp., has been named president of Froedtert Malt Corp., major division of BP.

Fred H. Pinkerton moves up to marketing director at Burry Biscuit Co.

Robert W. Wagstaff, former board vice-chairman and executive v.-p. of The Vendo Corp., takes over as chairman of Kansas City Coca-Cola Bottling Co.

E. W. Rawlings moves over to operations & finance executive v.-p. at General Mills, with **Delbert F. Wright** appointed to administration and employee relations v.-p. post.

Dr. Shane MacCarthy, former director of President's Council on the Fitness of Youth, under Pres. Eisenhower, takes over as public relations v.-p. at Sweets Co. of America.

John L. Bricker moves up to marketing v.-p. of Foremost Dairies.

R. C. Henley becomes national marketing manager of Carnation Co.'s Evaporated Milk Div.

H. J. Wolflisberg, Nestle Co. president, has been elected president of Chocolate Manufacturers Assn.

Clarence M. Gay, Orlando, Fla. banker, is now a board member of Southern Bakeries Co.

Harry A. Trimm, Jr., is now marketing director of Stokely-Van Camp's Frozen Food Div.

Milton E. Parker resigned as professor and director of food engineering at Illinois Institute of Technology and will continue consulting activities, specializing in caloric density control.

Dr. John M. Jackson, American Can Co's Research Div., is new president-elect of Institute of Food Technologists.

John C. Mackerer moves up to marketing v.-p. of The Charles E. Hires Co.

Curtis L. Taggart has been named president of Revere Sugar Refinery, United Fruit Co. subsidiary.

Paul S. Willis, GMA president and guest speaker at Paris Trade Fair, urged greater liberalization of French import regulations that now bar entry of many U. S. food products.

Ralph A. Hart, former executive v.-p. of Colgate Palmolive and president of Colgate International, has been named president of Heublein Inc.

Chester J. Conn retired from presidency of Long Island Packers.

Seth W. Heartfield, Sr. has been named general chairman of International Assn. of Ice Cream Manufacturer's '61 convention, to be held in Washington, D. C., Oct. 25-27.

Charles V. Lipps, Curtiss Candy Co. president, has been elected president and chief executive officer of Candy, Chocolate, and Confectionery Institute.

Kenneth McAllister, former senior v.-p. of Benton & Bowles, becomes advertising v.-p. of Thomas J. Lipton Inc.

Industry

General Mills has established a Refrigerated Foods Div. with v.-p. B. M. Hagan as general manager.

Paxton & Gallagher Co. has formally changed its corporate name to Butter Nut Foods Co.

Hungerford Packing Co., has purchased Delta Canning Co., Inc., Deltaville, Va. tomato canners.

Pacific Hawaiian Products Co. is negotiating for acquisition of Cinch Products Inc., packaged food mix manufacturer.

Consolidated Foods has combined operations of its subsidiaries, **Eagle Food Centers,** and **Piggly Wiggly Midwest.**

Pillsbury Co. has purchased **Gibbs Goodies,** Ludington, Mich. frozen food firm.

Cook Coffee Co. has entered dry goods industry with purchase of Uncle Bill's Discount Department Stores, Cleveland.

Associated Industries

Dow Chemical Co. now has available commercial quantities of high-purity triethylene glycol, recently cleared by FDA for use in food packaging.

Glass Container Manufacturers Institute has new president—James J. Ferguson, v.-p. of Laurens Glass Works Inc., Laurens, S. C.

American Machine & Foundry Co. has acquired 70-year old Dutch bakery machinery firm in Dordretcht, Holland.

Peter Wood, newly elected v.-p., is now director of Fritzsche Bros. Flavor Div.

Food Machinery & Chemical Corp. has changed its corporate name to FMC Corp. due to its diversified production of industrial machinery, chemicals, and defense materials.

The Kordite Co. has selected Tyler, Tex. as site of third major plant addition to manufacture plastic packaging products and films.

Du Pont's new polyethylene plant in Victoria, Tex. is now in full commercial production.

Celanese Corp. of America has centralized its expanding foreign activities in a subsidiary, Celanese International Corp.

American Viscose Corp. plans construction of facilities for production of "Avicel," new microcrystalline cellulose food ingredient, on a commercial scale.

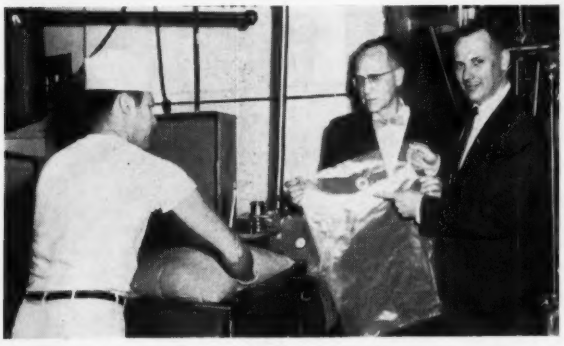
Lord Baltimore Press has elected Leonard Dalsemer, formerly president, to board chairmanship, with William B. Banks succeeding him as president.

Chas. Pfizer & Co., Inc. has announced appointment of Dr. Robert J. Feeney as commercial development director.

A. G. Bardes Co., Inc. has opened a new plant in Milwaukee to manufacture transparent plastic containers, lids, envelopes, and vacuum-formed packages.

Deaths

Hammond Burke Nicholson, 65, former chairman and president of The Coca-Cola Co.



THROW-AWAY PLASTIC MILK CONTAINERS are used by San Antonio dairy for 3 gal. and 6 gal. delivery to homes and commercial establishments using dispensers. Chuck Ernest, manager of Knowlton's Creamery, Milk Div., holds bag while Ed Knowlton, manager and partner in firm, points to hole where plastic spout is inserted. Employee (left) fills a bag.

for pre-cooling and preserving foods

Series "M" King Koolers operate with low velocities in the cooler to maintain temperatures of 34° to 50° F., using ammonia or Freon refrigerants. Centrifugal blowers pull air through the cooling coil for efficient heat transfer. Featuring automatic temperature and refrigerant control, system defrosts during off cycle. Water defrost methods are also available.

King Product Koolers are easily and quickly installed and serviced . . . assuring economy, efficiency, safety. Ceiling suspended and floor types are available in a complete range of sizes from 3,000 to 18,000 C.F.M.

PRODUCT KOOLERS
Manufacturers of
King
sharp freeze, cooling, ventilating and heating systems.
COMPANY OF OWATONNA
905 N. Cedar St. • Owatonna, Minn.

for ventilating, heating, filtering and cooling

Designed for use in dairy food processing and industrial plants, Klimatic King units are fabricated of galvanized steel, insulated to eliminate condensation, have automatic temperature and ventilating controls. Two speed motors insure operating economy. Klimatic King eliminates excessive humidity, objectionable odors, dust and air circulation problems and wide temperature variations. Engineered to meet your requirements, units may be suspended from the ceiling or mounted on the roof; located in remote areas with a duct-work system providing necessary air delivery. Sizes from 3,100 to 20,000 C.F.M.

KLIMATIC KING
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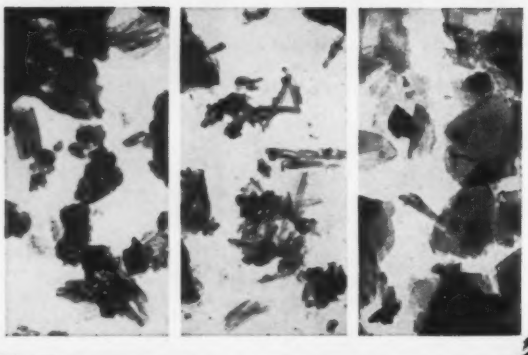
CIRCLE 93 ON INQUIRY CARD

Electron micrographs of Micro-Cel A, C and E show particle structures ideal for food applications.

1μ



Micro-Cel helps keep food mixes bone dry!

Micro-Cel®, Johns-Manville's new synthetic calcium silicates, answers caking problems. Highly absorbent, it remains a free-flowing powder after absorbing triple its weight. High bulk (4½ lbs. to a cu. ft.), irregular particle shape and high surface area, make it ideal for coating sticky and hygroscopic particles. Micro-Cel gives low cost per pound-volume. To keep food mixes free-flowing, even under the worst conditions, try Micro-Cel. For information, samples and assistance, mail coupon below!

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Celite Division

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JOHNS-MANVILLE, Box 14, New York 16, N. Y.
In Canada: Port Credit, Ontario.

☐ Please send additional data.

☐ Please send free sample of suitable grade of Micro-Cel for use in:_____

☐ Have local Sales Engineer contact me.

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Company_____

Address_____

City_____ Zone____ County_____ State____

Celite Division synthetic silicates used as anti-caking agents up to 2% are not considered food additives as defined by FD&C Act Amended, Section 201(s).

new equipment & supplies

Teflon-Lined Rubber Hose

A new tubing combines Teflon's outstanding physical and chemical properties with Neoprene's thermal protection and resistance to scuff, weathering, and oil.

The Teflon liner is available in ⅛-1 in. i.d. sizes, covered with ⅛-in. Neoprene rubber or other elastomers. The covering withstands continuous service temperature of 200F. for several months without cracking. Teflon tubing is unaffected by any commercial chemical and does not contaminate foods.—*Pennsylvania Fluorocarbon Co., Philadelphia, Pa.*

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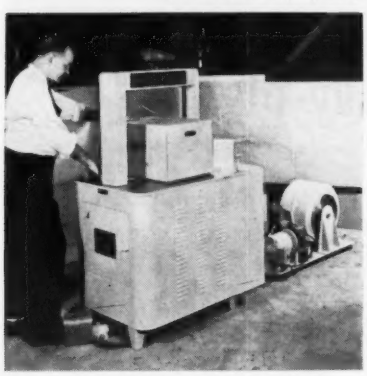


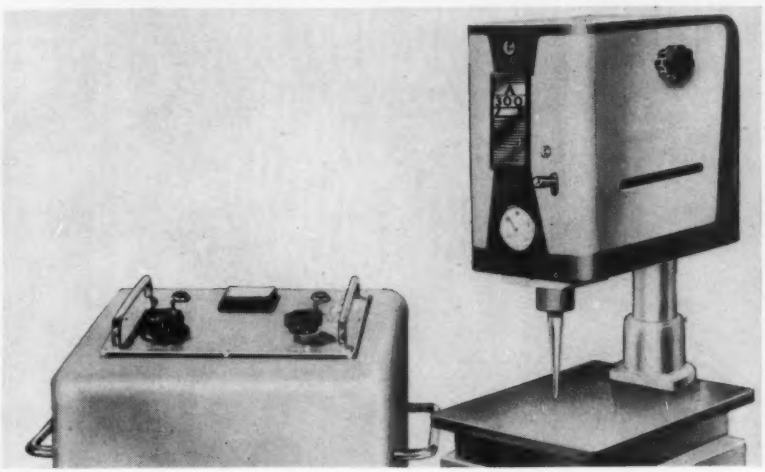
Applies Rayon Strapping

Completely automatic, this unit straps packages 6x6 in. to 20x20 in., and in any length.

Known as Model AVM-1, it rayon straps these packages without machine adjustment. Strapping width can range ¼ to ¾ in. The automatic dispenser holds a coil of rayon strapping equal to four 100-lb. coils of metal strapping, thus reducing down time because fewer coil changes are needed. The seal magazine holds 500 seals.

Machine dimensions: Table height, 34 in.; overall height, 60 in.; width, 28 in.; and length, including dispenser, 81 in.—*American Viscose Corp., Philadelphia.*

Circle 402 On Inquiry Card



Ultrasonics Perfects Sealing of Films

Films that resist efficient sealing by heat, adhesives, or chemicals may now be sealed by a new ultrasonic unit. Materials so handled include Mylar, polypropylene, vinyl, polyethylene, and plastic-coated papers and boards.

Moreover, the machine seals these films quickly, economically, and permanently. It readily fits into a packaging line and operates in any position with little power. Maintenance costs are termed negligible.

Known as Ultra Sonic Sealer, the equipment consists of a 20 kc., 30-w. power generator which feeds a magnetostrictive-type transducer set in a separate welding head. Vibrations are applied to plastic materials by a 'cone' affixed to the transducer to concentrate ultrasonic energy in an extremely small area. This arrangement increases the amplitude of vibration and produces pressure of 1000-2000 psi.

The vibrating tool tip, when placed perpendicular to an overlapped plastic film resting on a solid mass, so compresses the resilient material that heat is generated internally until fusion takes place. Since the plastic film is compressed between two relatively cold members, surface heat is carried away at a rate sufficient to provide ideal fusion—at the two inner surfaces of the overlapped film.

As a result, special molecularly oriented films do not fully lose their characteristics at the weld area, as in conventional heat bonding. Even heat shrinkable films used in tight packaging of foods are not distorted or shrunk at the weld area.

The sealing technique does not

(Continued on page 97)

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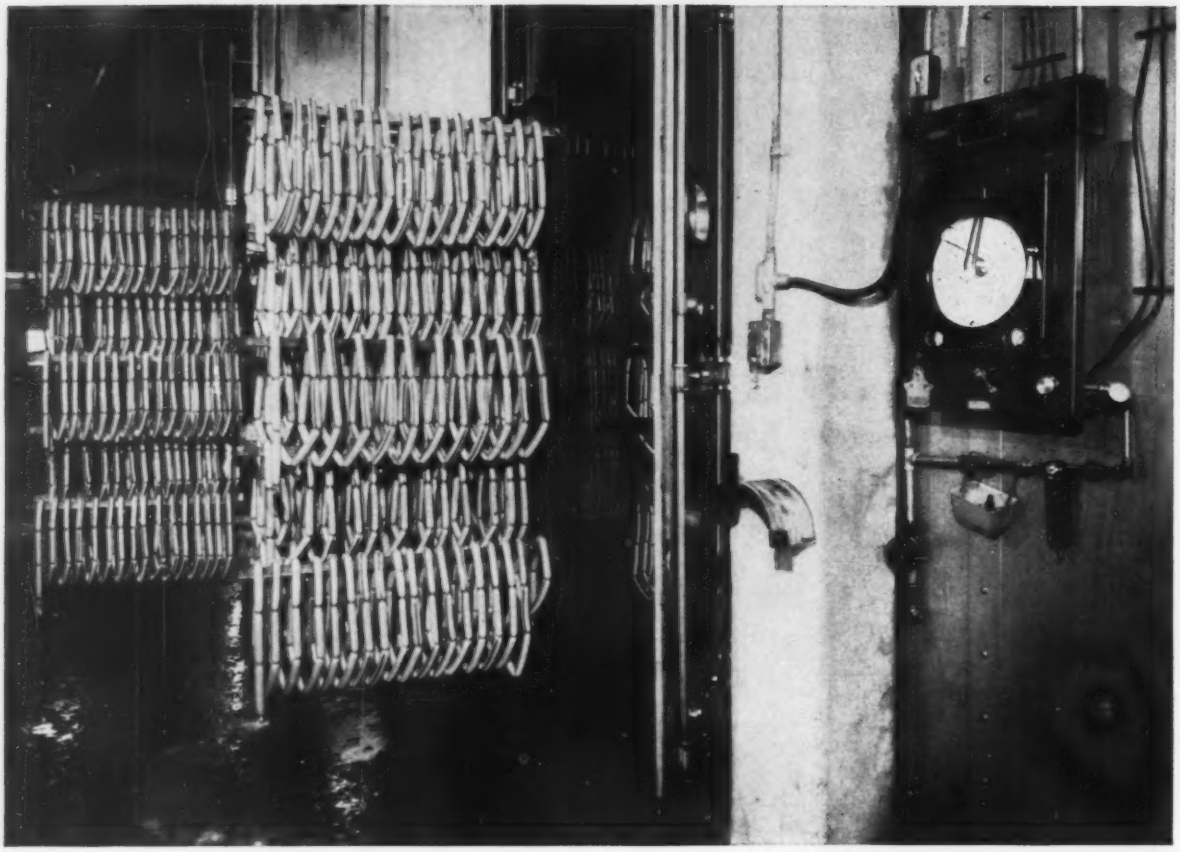


Major improvements at Cudahy plant include new *Taylor-controlled* Julian smokehouses

During the past year the Cudahy Packing Co.'s plant in Phoenix, Arizona, has improved its profit-making potential with addition of a new 35-cage capacity Julian smokehouse facility, supposed to be the largest in the Southwest. Each of the smokehouses is controlled by a Taylor FULSCOPE* Recording Wet-and-Dry-Bulb Controller which keeps strict watch over humidity and temperature. The dry-bulb control adjusts the main steam valve to maintain a constant temperature in the smokehouse. The wet-bulb control maintains a constant humidity by throttling the spray water valve and by positioning the inlet and outlet dampers to control amount of recirculation. Typical of hundreds of Taylor smokehouse control systems in service, the Cudahy application provides these important benefits, which also can be yours:

1. Minimum shrinkage
2. Minimum smoking time
3. Low operating costs
4. Consistent high quality

That's why so many processors specify "Taylor equipped as usual" when they order new equipment. Why don't you call your Taylor Field Engineer or write now for **Catalog 500MP.** Taylor Instrument Companies, Rochester, New York, or Toronto, Ontario.

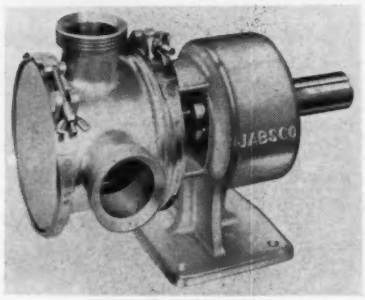
*Reg. U.S. Pat. Off.

Taylor Instruments **MEAN ACCURACY FIRST**

require skilled personnel, and the welding tool can be touched without danger of burns. Lack of surface heat allows prolonged contact of the tool with the material without burning through the weld.

Furthermore, ultrasonic sealing permits bonding of plastics which are coated with contaminants, because ultrasonic energy cleans the surface as it welds.—*Ultra Sonic Seal, Inc., New York City.*

Circle 403 On Inquiry Card



Versatile Sanitary Pump

A new line of sanitary pumps combines the priming ability of positive-displacement types with transfer ability of a centrifugal.

Called "Pureflo," the stainless-steel unit uses a flexible Neoprene impeller and offset cam to create high vacuum for instant self-priming. Vertical lifts of water up to 15 ft. when dry, and 25 ft. when primed, permit locating the pump well above the product source.

Models range 10, 25, 50, and 100-gpm. capacities. The Neoprene impeller is non-toxic, tasteless, and odorless. No special tools are needed to disassemble the pump, while quick-release clamps make installation and on-the-job servicing easy.

Pump heads rotate 360 deg. to assure easy pipe connections. And units operate in either direction with equal efficiency.—*Jabsco Pump Co., Costa Mesa, Calif.*

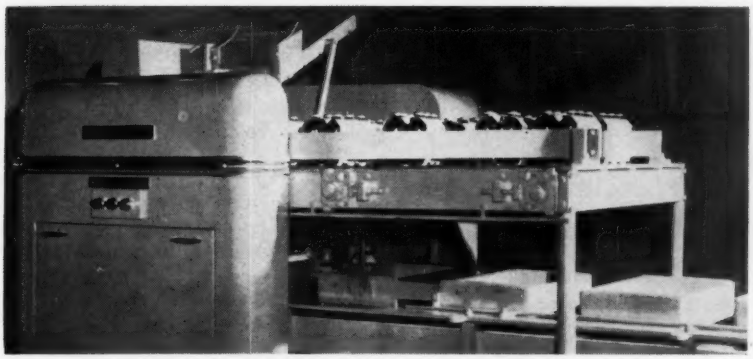
Circle 404 On Inquiry Card

Speeds Bin Discharge

Suspended in a storage bin, a new activator speeds the outflow of dry materials. A single unit influence about 400 cu. ft. of material, a zone of about 8-in. dia. by 8 ft. In large bins, two or more units provide free movement of contents.

The self-contained activators include a framework and gyratory assembly. All components fit through an 18-in. manhole and can be bolted together within the bin. A ¾-hp. motor is sealed with an enclosure in the unit. — *Vibra Screw Feeders, Inc., Clifton, N. J.*

Circle 405 On Inquiry Card



Compact Unit Cases 100 Six-Packs Per Min.

Teamed with a Cluster-Pak packaging unit, this case packer handles product from filling line to case at speeds up to 600 cans or bottles per min. No changeover is necessary when shifting from bottles to cans or vice versa.

Known as V-2, its simple switch control enables safe, efficient operation by one semi-skilled operator. Since the packer is synchronized with the rest of the line, the only attention required is periodic filling of the hopper. In operation, a conveyor forms a double line of packages, and a three-stage cycle then groups, positions, and cases them.

(Continued on page 98)

COMING YOUR WAY

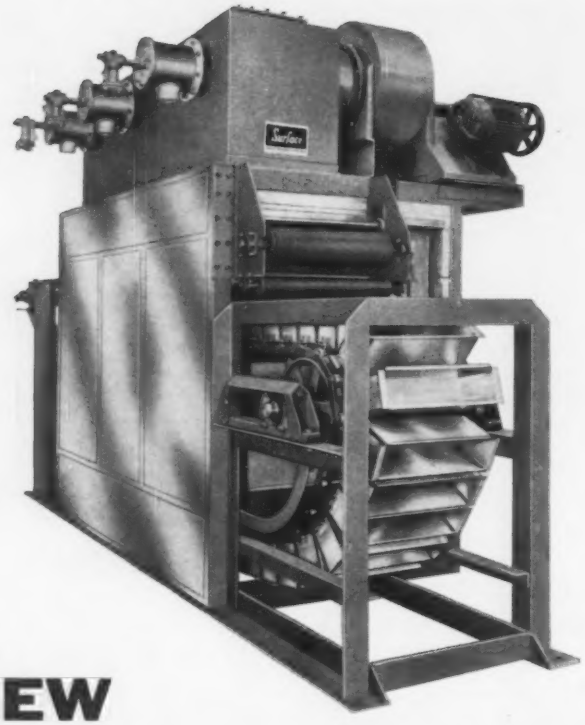
THE NEW PFIZER

Flo-Rite T.M. PAK

Citric Acid

PFIZER Flo-Rite T.M. PAK

HAVE YOU SEEN PAGE 103?



NEW continuous automatic drying and toasting

This toasting machine, long in development at Kathabar laboratories, may be precisely the means of putting your drying, puffing, and other high temperature processing operations on a continuous basis. Stainless steel trays convey the material, while in a "fluidized" state, through the oven under precise temperature control. Make use of Kathabar's unique fund of hard-earned experience in continuous automatic control of temperature and humidity to speed the processing of a wide range of foods and chemicals.

KATHABAR®

where the experts turn for help

SURFACE COMBUSTION, 2382 Dorr St., Toledo 1, Ohio
a division of Midland-Ross Corporation MR

Please send facts on ☐ *drying* ☐ *toasting for following application:*

.....

name & title .....

company .....

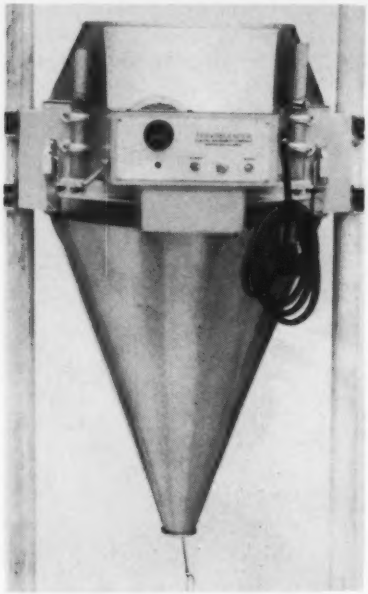
street .....

city .....*zone* .....*state* .....

Equipment & Supplies

Unit requires less than 3x5 ft. of floor space plus conveyors.—*Mead Packaging, Atlanta, Ga.*

Circle 406 On Inquiry Card



Automatically Controls Blending of Liquids

Through special hydrometer control, this unit proportions two liquids to a dial-selected mix density.

Known as Model 800 Servoblender, the system is accurate to ±½% and its automatic operation is compensated for temperature and flow variations. Developed for cannery syrup making, it handles any input up to 65 Brix and reduces it to any desired density.

In operation, liquids to be blended are mixed as they flow over a level-controlling weir. Positioned in the center of the tank is a hydrometer with an armature in its stem. Its vertical position is sensed by a differential transformer, which is adjusted vertically by a calibrated knob.

With the transformer positioned at the density-control point, the hydrometer will rise or fall until the electrical center of its armature coincides with that of the transformer. Motion of the hydrometer energizes the servo system to open and close valves on the inlet line until the hydrometer is correctly positioned.—*Exactel Instrument Co., Mountain View, Calif.*

Circle 407 On Inquiry Card

Rubber-Coated Doors

Offering the combined advantages of a rigid rubber door with a flexible curtain, this door absorbs rather than resists impact by fork trucks.

Called Durador, it has a ⅜-in. core of special plywood covered by a ¼-in. rubber coating at the bottom half. Top half of door has a ⅛ in. rubber coating. For leading edge protection, there is a layer of ⅜ in. rubber. A full-length flexible rubber hinge provides positive return to normal closure after each opening.

Installation is simple. There is no need for special jambs or to recess any equipment in the floor or lintel.—*Clark Door Co., Inc., Newark, N. J.*

Circle 408 On Inquiry Card

In-Stream Refractometer Offers Extreme Control

A new differential refractometer offers unique control of liquid process streams. Unit operates on very small changes in index of refraction of the stream compared to that of a sealed or flowing reference standard.

It measures full-scale changes in refractive index as small as 0.00005 with stability of better than 1% of full scale in 24 hr. Sensitivity is 0.5% of full scale, or 0.00000025 R.I.

An important feature is the flowing reference cell, which permits accurate blending of two streams even though one varies in composition. One stream flows through the reference cell continuously and the same stream plus additional blended material flows through the sample cell.

Moreover, the instrument's high sensitivity enables gaging of impurities in final-product streams. Ranges as narrow as 0 to 500 ppm. full scale can be provided.—*Waters Associates, Framingham, Mass.*

Circle 409 On Inquiry Card

Clear Label Adhesive

Offering a new high in attractive and efficient bottle labeling is a new transparent adhesive.

Called Clearchem, it eliminates unsightly globs and smears which result from slip or squeeze-out of adhesive during labeling. Moreover, the product offers superior bonding

(Continued on page 101)

Easy to Install

RID-A-BIRD PERCH

Eliminates Bird Problems

Unsightly, unsanitary and costly conditions caused by pest birds can now be safely solved by the unique Rid-A-Bird perch. Easily installed (see photo) and refilled only twice a year, the perch insures permanent removal of sparrows, starlings and pigeons. Successful installations include factories, aircraft hangars, grain elevators, loading docks, warehouses, farm buildings, garages, stores and buildings.

Send for new brochure showing installation details:

RID-A-BIRD, INC.
P. O. Box 22, Dept. FE-2
Muscatine, Iowa

NAME

ADDRESS

CITY STATE

FOR MORE INFORMATION...

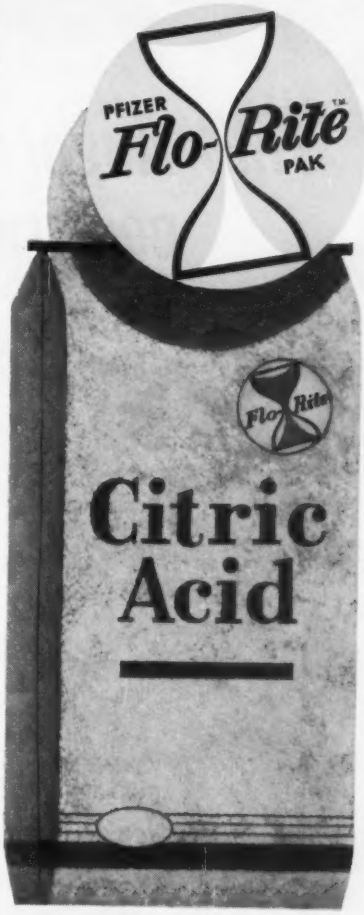
... simply circle key item number on handy Inquiry Card—back of book. Then print your name and address, and mail. For your convenience, these items are also listed and keyed in Reader Inquiry section.

COMING YOUR WAY

THE NEW PFIZER

Flo-Rite T.M.

PAK

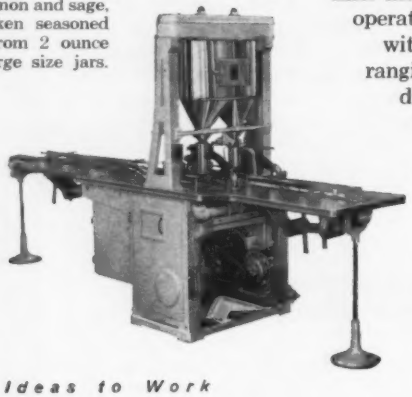


HAVE YOU SEEN PAGE 103?

FMC Auger Fillers are "quick change" performers for Spice Islands

Spice Islands Company, world famous San Francisco packer of exotic spices and seasonings, selected FMC Auger Fillers to meet rigid requirements. They needed accuracy and speed. But just as important they had to have quick changeover in packaging a wide range of sizes and products of varying characteristics. Fully automatic and semi-automatic fillers handle with equal facility such spices as curry and garlic powders, ground cinnamon and sage, hickory smoked salt, and chicken seasoned stock base. Containers range from 2 ounce "apothecary" to regular and large size jars.

The Duplex Auger Filler model HG-84 shown here is one of several units installed at Spice Islands. Completely automatic, it is available with a choice of filling methods—cam volumetric, gross weighing or auger combined with vacuum for packing dusty products—at speeds up to 70 packages per minute. Many other auger filler models for automatic or semi-automatic operation are designed to handle products with "difficult" characteristics at speeds ranging up to 140 units per minute. Production run accuracy is outstanding in filling cans, jars, cartons or other containers. Size and product changeover is exceptionally fast and simple for powders, granules and certain paste products.



Putting Ideas to Work

FOOD MACHINERY AND CHEMICAL CORPORATION

FMC Packaging Machinery Division

Stokes & Smith Plant

4914 SUMMERDALE AVENUE, PHILADELPHIA 24, PA.

For the whole story of how FMC Auger Fillers can improve your packaging, write for your copy of Bulletin P-811.

and machining properties for economical, trouble-free operation.

Ice-proof and water resistant, the adhesive spreads evenly to a thin film at high machine speeds and grips virtually any kind of label stock. It has good pot stability, won't drip from picker plates, is not stringy, and machines the same in any climate. In tests, bottlers report up to 33% increased coverage. — *National Starch and Chemical Corp., New York City.*

Circle 410 On Inquiry Card

Tape Seals Drum Pack Quickly, Economically

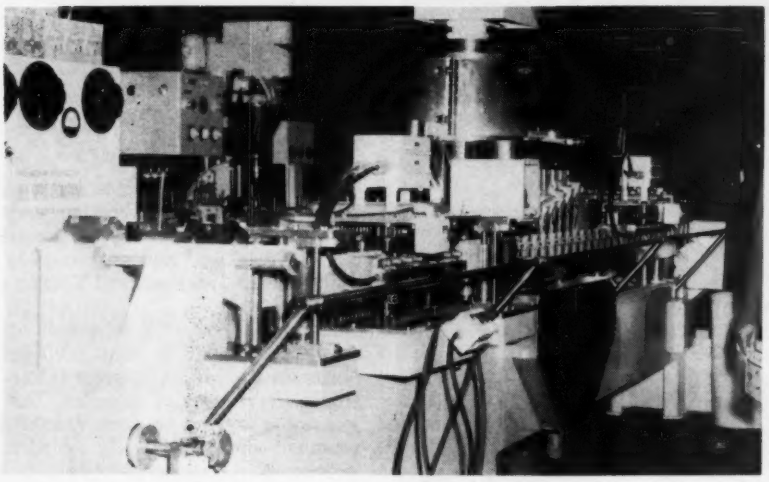
Substantial savings are reported with the use of a pressure-sensitive filament tape for holding the interlocking flaps of a drum-pack shipping container securely. In material alone, savings can exceed 4c. a container.

The drum pack is gaining popularity partly because it can be handled by smaller lifting blades, which allows more space for material handling. Flaps of the drum pack are made by double-scoring the edges of the borders and folding them to form extra borders about 4 in. wide. Resembling the borders of a lid, the flaps give the container a drum-like appearance.

Flaps are secured in seconds with only a few clips of tape applied to each corner. This also holds them close to the container body. One operator easily applies the tape with a manual dispenser. And the tape has no sharp edges to cause injuries.

In addition to facilitating container handling, the tape permits easy opening of the sealed flaps with knife or scissors.—*Minnesota Mining & Manufacturing Co., St. Paul, Minn.*

Circle 411 On Inquiry Card



Forms, Fills, Seals Pouches at 600 Per Min.

Pouch forming, filling and sealing speeds of up to 600 per min. are reported for this new packaging unit, which handles most supported films, papers, and foils.

Known as Continuous Motion Packager, it operates with web material and formed pouches moving at constant speed. Thus, in sequence, it forms the web, side-seals, cuts the web to make individual pouches, fills the pouch, and top seals. Moving filler nozzles and seal bars follow the web material as packaging proceeds.

Heat sealers, in groups of eight bars, are mounted on traveling beams that follow the work flow to make eight simultaneous side and top seals. Despite the high speed at which the sealing units operate, the system provides ½-sec. dwell time. Thus, relatively low sealing temperatures can be used, which adds to the strength of the seal.

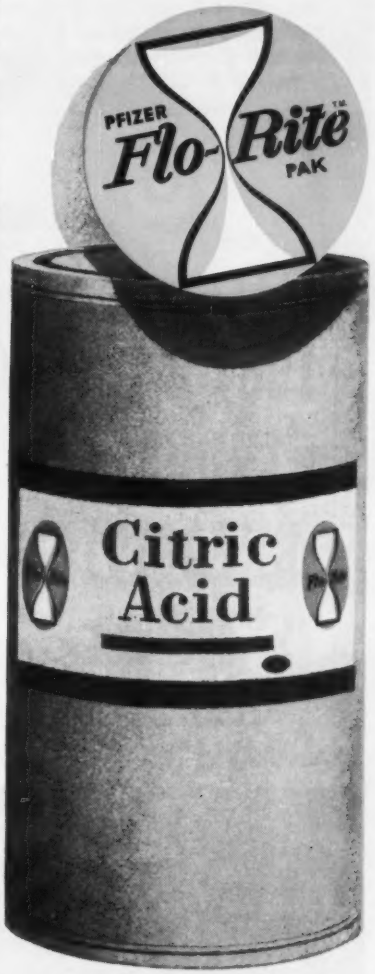
The filler consists of 16 'duckbill' nozzles which follow an orbital path. They are filled at the rear of the unit by an auger, then rotate to a position over the pouches. Here, nozzles are cram-

COMING YOUR WAY

THE NEW PFIZER

Flo-Rite T.M.

PAK



HAVE YOU SEEN PAGE 103?

med down into the pouches and opened. This provides filling from the bottom, which eliminates air displacement and minimizes spillage and 'dust.'

First application of the unit will be packaging of a free-flowing beverage mix. Meanwhile, methods for handling non-free flowing products are under development.—*Bartelt Engineering Co., Inc., Rockford, Ill.*

Circle 412 On Inquiry Card

Broad-Belt Infeed Unit automatically pushes a pre-selected number of containers into a pasteurizer, cooler, or storage conveyor. Standard models (Select-O-Count) have pusher-arm widths of 36, 48, and 60-in.—Island Equipment Corp., Miami, Fla.

Circle 413 On Inquiry Card

Sanitary Pump eliminates all contact of moving parts with product. Intake and outlet are one continuous flexible tube which is 'squeezed' by unit's ball-bearing rollers. Two models handle 54 and 185 gph., respectively.—The Randolph Co., Houston, Tex.

Circle 414 On Inquiry Card

Come and See...

the greatest collection of everything that's new, exciting and different . . . 953 booths . . . 303 exhibitors! Many new ideas to take home and apply to your own bakery operation. Join the thousands of bakers who will participate in the Baking Industry's 1961 Pageant of Progress. See you in Atlantic City!

yes, make your reservation, TODAY!

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Make your reservations today . . . for further information write
AMERICAN BAKERS ASSOCIATION, 20 N. Wacker Drive, Chicago 6, Ill.

For the Lab

Precision Unit Calibrates Temperature Sensors

This unit offers accurate and convenient means for calibrating temperature-sensing devices by reproducing primary and secondary points in the International Temperature Scale.

Known as Freezing Point Standards, instrument is supplied with National Bureau of Standards certified freezing-point samples. Latter are contained in pure graphite crucibles and hermetically sealed to prevent contamination. Additional features: Automatic temperature control, rapid warm-up, 15-20 min. freeze-out time, and ease of operation.—*Temptron Inc., Reseda, Calif.*

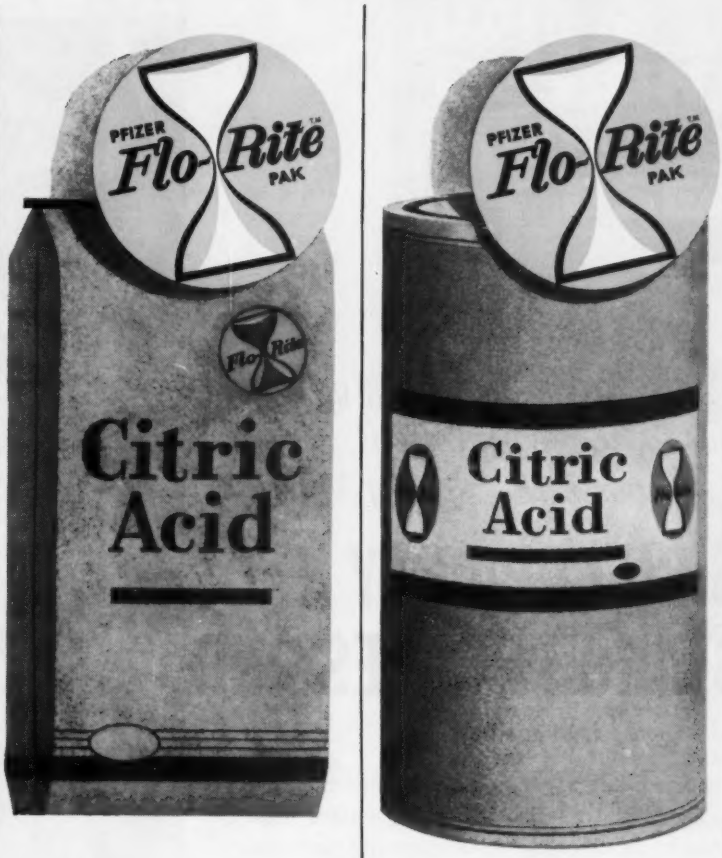
Circle 415 On Inquiry Card

Gas Chromatograph with highly sensitive thermal-conductivity detector combines stability, fast response, and high resolution. Instrument (GC-2A) can be equipped with small-diameter columns for fast analysis, large-diameter columns for trace analysis, and preparative columns. — Beckman Instruments, Inc., Fullerton, Calif.

Circle 416 On Inquiry Card

THE NEW PFIZER Flo-Rite™ PAK

KEEPS PFIZER CITRIC ACID FREE-FLOWING, EASIER TO USE... AT NO EXTRA COST TO YOU!



Coming your way in all future shipments—citric acid that stays free-flowing until you are ready to use it!

The Pfizer Flo-Rite Pak embodies a unique combination of advances, in both production and packaging.

To the user this means an anhydrous citric acid that is—and **stays**—easier to handle and measure.

Extensive tests and studies demonstrate that Flo-Rite Pak works—even when subjected to extremes of temperature and humidity. As an example, Pfizer Anhydrous Citric Acid in the new Flo-Rite Pak was placed in the hold of a vessel sailing from New York to Los Angeles through the Panama Canal. Upon arrival it was stored for eight months, then returned to New York where the containers were opened. The acid was found to be as free-flowing as it had been the day it was shipped!

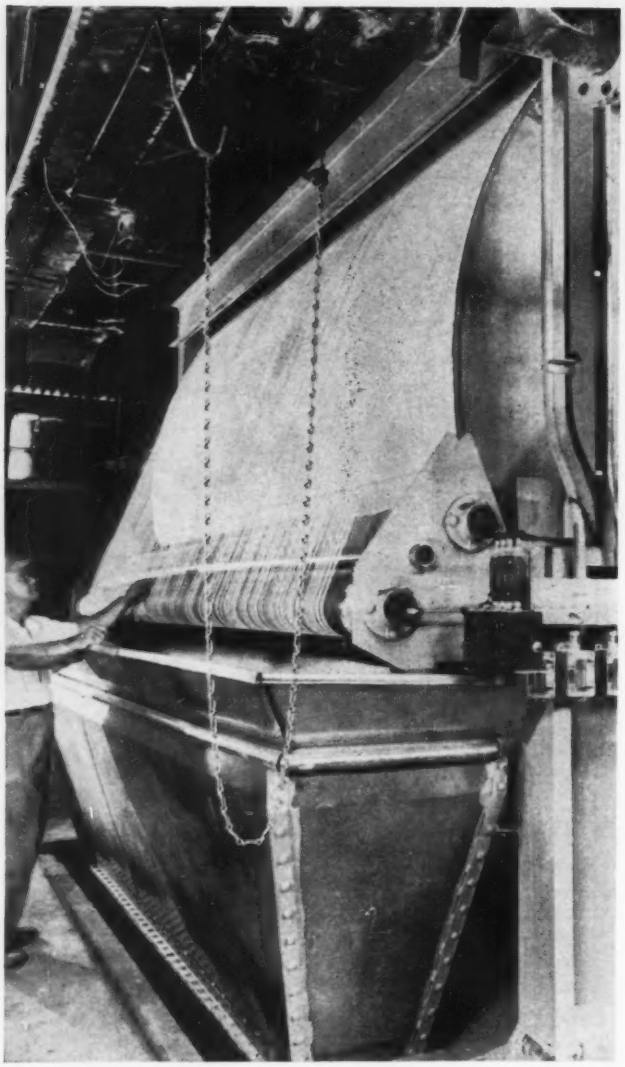
And now Pfizer makes its new packaging available to you! Flo-Rite Pak bags have a skidproof exterior surface, designed to help prevent slippage from pallets or stacks and consequent punctures that cause the acid to be exposed. All Flo-Rite Pak bags and drums employ polyethylene, inside, to minimize moisture-penetration. Drums also contain a dessicant—moisture-absorbing silica gel—that provides continuing protection after the drum has been opened, provided proper re-sealing is effected.

Best of all, Flo-Rite Pak citric acid, with its greater-than-ever resistance to caking, is available to you at not one extra cent of cost. It is offered as part of Pfizer's continuing efforts to provide the best possible product to its citric acid customers.

Don't settle for anything less—order Pfizer Flo-Rite Pak Citric Acid. Available from Chas. Pfizer & Co., Inc., Chemical Sales Division, New York 17, New York.

Science for the world's well being®
Pfizer
CHEMICAL SALES DIVISION

BELOW: One of the two Oliver String Discharge Filters used for starch dewatering at A. E. Staley Mfg. Co.



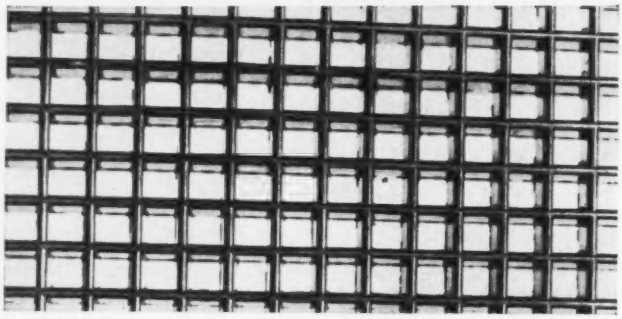
Dorr-Oliver advanced design filtration equipment gives A.E. Staley Mfg. Co.

HIGH CAPACITY STARCH PROCESSING

Modernization of starch processing at A. E. Staley Mfg. Co., Decatur, Ill., includes high capacity dewatering prior to drying provided by two Oliver String Discharge Type Filters.

These stainless steel filters are typical examples of the flexibility offered by Dorr-Oliver equipment in meeting specific job requirements. Special features include the new D-O molded rubber sectional waffle-type drainage deck. This design provides the greatest amount of open drainage area available in any type of grid, resulting in high filtering capacity and exceptionally low filter cake moistures. The smooth, rounded rib surfaces offer excellent support for the filter media, increases cover life and provides for easier cleaning without removing grids. The special rubber composition eliminates the problem of corrosion at a most vulnerable point.

For more information on the complete line of D-O equipment for the starch industry, write Dorr-Oliver Incorporated, Stamford, Connecticut.

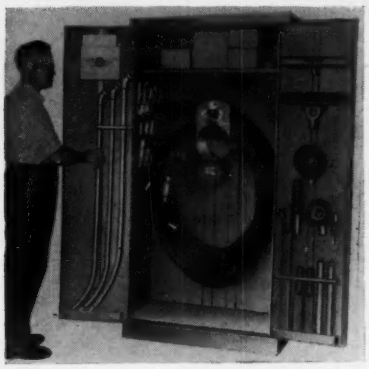


ABOVE: New waffle-type rubber drainage grid installed on the above filters. Approximately ½" square openings provide exceptionally large drainage areas. A sample of this grid will be sent on request.

DORR-OLIVER

WORLD-WIDE RESEARCH • ENGINEERING • EQUIPMENT

Plant Sanitation & Maintenance



Offers Convenient Storage

This storage cabinet improves plant apearance while protecting vacuum-cleaning tools and accessories from loss or damage.

Designed for 1½- or 2-in. tools, its built-in rack holds a large variety of equipment (as shown). The cabinet is 40x78x18 in., made of 18-gage steel with green enamel finish, and supplied by *U. S. Hoffman Machinery Corp., 103 Fourth Ave., New York City.*

Circle 451 On Inquiry Card

Epoxy Floor Resurfacer

A new cold-process, epoxy-type resurfacing and patching material for concrete, wood, and metal floors offers superior resistance to abrasion and chemicals, durability, easy application, and rapid curing.

Composed of epoxy-resin binder, pigmented hardener, and special sand aggregate, product (Tripoxy) can be applied either by regular personnel or maintenance men. No special tools or equipment are required, and a covering only ¼-in. thick is recommended. Finished floor may be walked on in 4-8 hr., is ready for medium traffic in 10-15 hr., heaviest traffic in 3 days. It may be troweled smooth or in degrees of roughness.—*Masury-Young Co., Boston.*

Circle 452 On Inquiry Card

Damp-Surface Primer

For use on damp concrete surfaces, a new primer eliminates the usual dry-time delay in applying floor coatings.

Known as Penntrowel, it offers firm bonding in cases where surfaces are believed to be dry, but actually contain some moisture. Primer can be applied with a stiff brush after normal surface cleaning.

A two-component, semi-viscous amber-colored liquid with high bonding strength, product resists acids, alkalis, oils, and solvents, also offers thermal shock resistance. One gallon covers 100-150 sq. ft., depending on roughness of the surface.—*Pennsalt Chemicals Corp., Natrona, Pa.*

Circle 453 On Inquiry Card

Improves Can Rinsing

Added to water in retorts and cooling canals, a new surface-acting agent enables faster and more thorough rinsing.

Known as Oakite RB, it eliminates water spotting and dulling so labels adhere better and corrosion is retarded.—*Oakite Products, Inc., New York City.*

Circle 454 On Inquiry Card

Homogenized Roof Coatings (liquid aluminum and asphalt types) have asbestos and asphalt components permanently suspended in sealing oils. This eliminates preparatory steps and setting of ingredients on applied surface.—Revere Chemical Corp., Cleveland.

Circle 455 On Inquiry Card

Pneumatic Cleaning of dry mops eliminates hand scraping and combing, saves time and labor. System (Sani-Mop Vac) includes flush-mounted slotted plate on floor or cabinet that exhausts dust to a separator.—U. S. Hoffman Machinery Corp., New York City.

Circle 456 On Inquiry Card

Plastic Pressure Pipe, corrosion-proof and capable of withstanding 100-psi. pressure at 250F., is available in 10- and 20-ft. lengths. Piping (Duracor) is of fiberglass mat and cloth construction with wall thicknesses ranging ¼-⅝ in. —The Ceilcote Co., Cleveland.

Circle 457 On Inquiry Card

FLEXIBLE STEEL CONVEYOR BELTS

The flexible open-mesh construction of LaPorte Belts makes them readily adaptable to a wide range of processing equipment in freezing, canning, dehydrating and pickling. It also permits the circulation of air and liquids around products in process and facilitates sterilizing with a steam gun while in motion. In addition, the open mesh assures a positive drive on the LaPorte Sprocket. These rugged, galvanized belts have uniform flexibility yet maintain a perfectly flat surface for containers, empty or filled.

If you process, package, store or ship food, it will pay you to use LaPorte Belts. Available in ½" x 1", or 1" x 1" in any length and practically any width. Ask your mill supplier or mail coupon for illustrated literature and prices.

MAIL COUPON TODAY

LA PORTE MAT & MFG. CO.
Box 124
La Porte, Indiana

Please send free literature on your Conveyor Belt.

NAME_____

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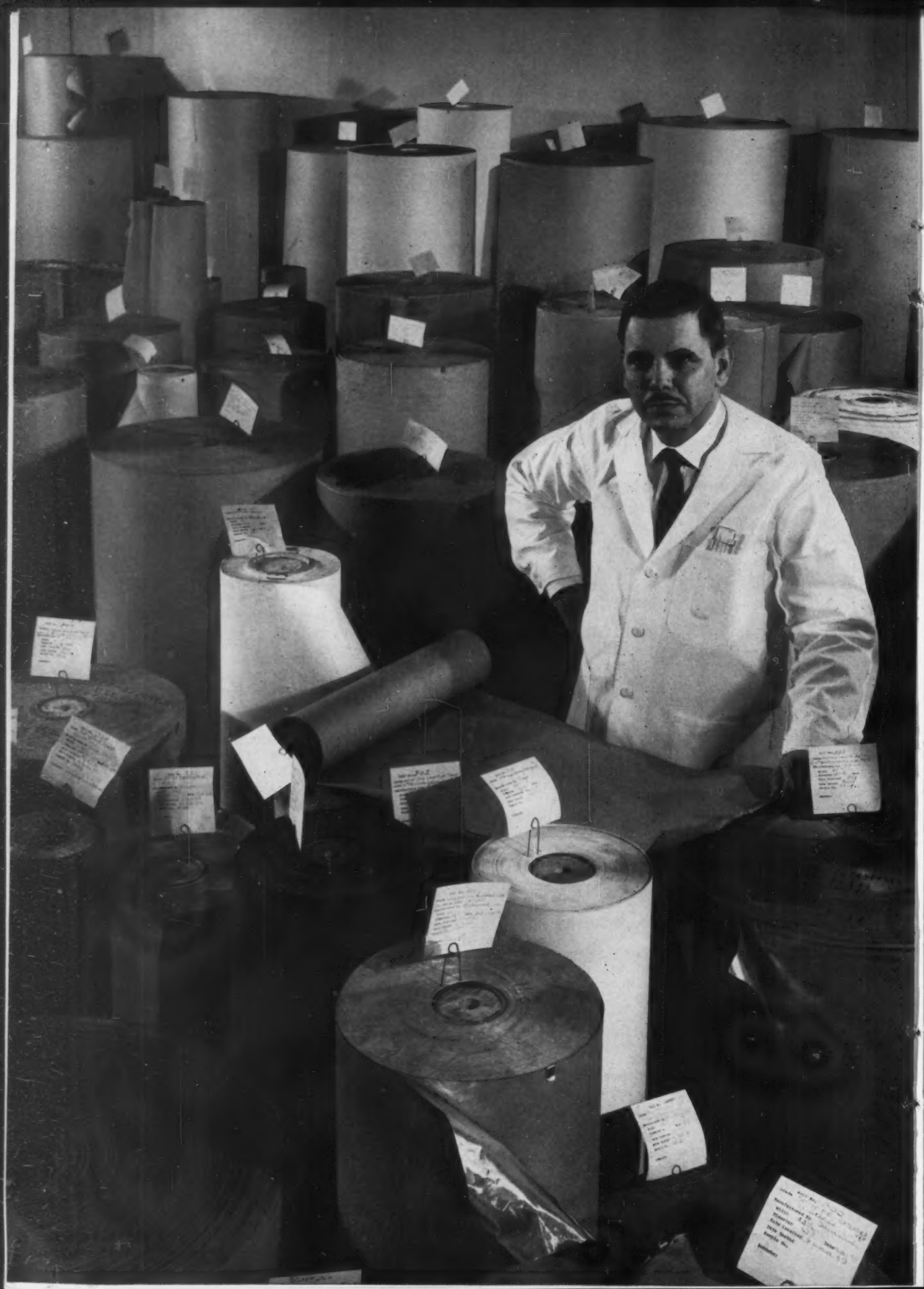

He knows all the right combinations

Using coatings and laminations, Union-Camp's Bob Harris has given corrugated boxes a host of amazing new properties.

OUR photograph shows Bob Harris standing in a forest of containerboard stock, paper and laminating materials. Here, he is comfortably at home.

He should be. Bob is a chemist, and a Project Supervisor at Union-Camp's Product Development Laboratory. Coatings and laminations are his specialty. Guesswork plays no part in his research.

"Today, thanks to coatings and laminations, there are few limitations on what you can package in corrugated," says Bob. "Using them singly or in combination, we can give corrugated boxes any number of protective properties. Water repellency, for example. Or snag and scuff resistance. Or resistance to acids and grease.

"We can coat the inside of a box so that it won't scratch the finish of an expensive hi-fi set. We can create moisture barriers for packaging soaps and other types of products.

"Everything we do is aimed at making the package more efficient by providing increased protection and reducing costly damage."

Recently, Bob and his group perfected a special *release* coating which is applied directly to the box. It prevents materials such as rubber or asphalt from sticking to the interior surface of corrugated boxes.

Bob Harris has also worked some minor miracles in improving the *printing* surface of Union-Camp containerboard. Using a special clay coating and resinous binder, an extremely smooth surface is provided that takes printing beautifully. The clean, sharp impressions that can now be achieved enhance the display value of the box and the sales appeal of its contents.

What lies ahead for corrugated combinations?

Bob and the rest of Union-Camp's development team are hard at work investigating new coatings that will result in even greater protection and economy for Union-Camp customers. This work is being carried on in a laboratory that can duplicate any shipping hazard a box is likely to meet in actual use. Its facilities include special *environmental rooms* that can simulate the heat, cold, or moisture conditions found anywhere on earth.

Find out what improvements Bob can make in *your* box. While you're about it, investigate Union-Camp's *complete* Packaging Evaluation Program available at no additional cost.

This service includes box design and development, specifications control, graphic design and merchandising counsel, box testing and in-plant surveys of your materials handling operation. An improvement in any one of these areas might produce greater efficiency and economy in your corrugated packaging operation.

A note on your letterhead will bring a prompt response. Why not write us today?

UNION-CAMP®
CORRUGATED BOXES

Union Bag-Camp Paper Corporation · 233 Broadway N.Y. 7, N.Y.

Plants:

*Dedham, Mass.; Allied Container Corp., Route 128, Allied Drive
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†Cleveland, Ohio; 10200 Miles Ave.
†Sharonville, Ohio; P. O. Box 86
Chicago, Ill.; 4545 West Palmer
†Benton Harbor, Mich.; 11th St. & Britain Ave.
†Monroe, Mich.; 1109 East Elm Ave.
†Eaton Rapids, Mich.; P. O. Box 8
*Baltimore, Md.; Eastern Box Co.; Wagner's Point
Jamestown, N. C.; 3704 Point Pleasant Rd.
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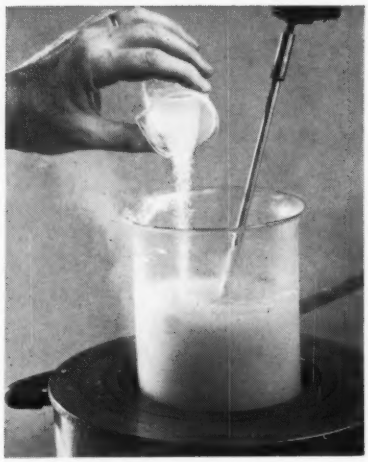
Lakeland, Florida; P. O. Box 454

*Subsidiary Companies †River Raisin Division

Model "F1" Dial Indicating Thermometer. Available in 46 different temperature ranges...from a cool minus 60° to a torrid 750° F. Applications? Unlimited! Who needs 'em? Bakeries and breweries. Laundries and foundries. For use in paper mills and making dills. In steaming boiler rooms and deep freeze lockers. Wherever there is need for accurate temperature reading. Inside? A solid liquid-filled system. Outside? A dial that is large and evenly calibrated. No squinting, thank you. And how will you have your capillaries? Flexible for remote reading? Or rigid for direct mounting? We've got 'em both ways. We've got 'em priced only one way . . . low! The "works" from $48.75 list. They're available from The Electric Autolite Company. So is further information . . . about the Model "F1" and our full-line of accessories. Just drop us a line. Write today to . . .

THE ELECTRIC AUTOLITE CO. INDUSTRIAL INSTRUMENT DIV. • PORT HURON, MICH.

Food Ingredients & Additives



APPLE PUREE with added monoglyceride can be whipped to a flavorful low-calorie dessert or topping.

WHEN FROZEN, rather than whipped, product has custard-like consistency. It can be chilled for spooning.

Monoglycerides Produce Low-Calorie Desserts

New applications of distilled monoglycerides provide low-calorie foods in the form of highly aerated foams. In contrast, they can also be made to act as foam suppressors.

The foamed product (Fruit-Fluff) is prepared with monoglyceride made from saturated fats by adding to pureed fruit, heating to 145-155F., and whipping. The resulting foam can be used as a low-calorie dessert, and as a topping, filling, or frosting for baked goods or other desserts.

The topping resists loss of air and water leakage for at least 3 hr. Tests indicate good retention of appearance and eating qualities after 48 hr. in the refrigerator. Much longer shelf life is possible when the prepared foam is frozen. The foaming effect is obtained by use of monoglycerides of saturated fats. In tests, the volume of applesauce has been increased 10-fold by addition of 1% of monoglycerides. Much greater volume increase is possible, but other additives generally are then needed to make the fluff tasty.

While foaming is achieved by use of monoglycerides of saturated fats, foam suppression results when monoglycerides of unsaturated fats are used. The latter can control troublesome foams such as occur in processing of syrups, fruit and vegetable juices, and preserves.

Low-calorie frozen desserts (Fruit-Freeze) can also be made from strained or pureed fruits by slight modification of the foaming process. To retain smoothness during freezer cabinet storage, 0.1-0.3% of commercial ice cream stabilizer is added. Then, instead of whipping the puree, it is frozen to 100-150% overrun. The frozen product does not melt readily at room temperature, but does tend to dry out after several hours' exposure.

The foam-stabilizing technique offers application beyond immediate production of foams. For example, unwhipped puree blends could be canned for institution or household use. Or they could be marketed as a dry product.—*Distillation Products Industries, Rochester, N. Y.*

Circle 466 On Inquiry Card

Salt in New Crystal Form

Common salt with modified crystal structure offers physical properties of potential interest to food processors.

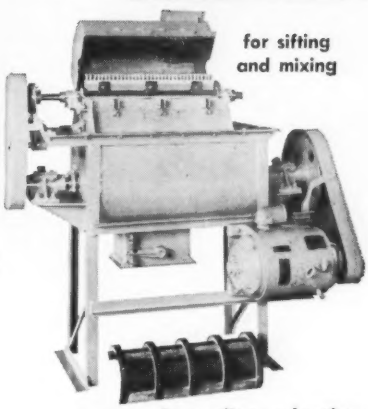
Special vacuum-pan processing,

(Continued on page 112)

have a special **MIXING PROBLEM?**

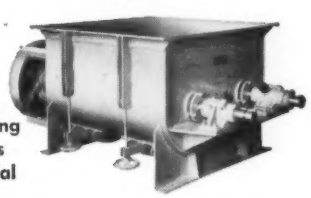
SPROUT-WALDRON
ADAPTIONEERED MIXERS
offer you
the right kind, the right size, the right style

and your **SOLUTION!**



for sifting and mixing

for cooling or heating while mixing



for handling viscous material

These three units are typical of many special mixers built with Sprout-Waldron Adaptioneering. Whether your mixing needs are standard or special—*check with Sprout-Waldron for economy and efficiency.* Ask for Bulletin 148.

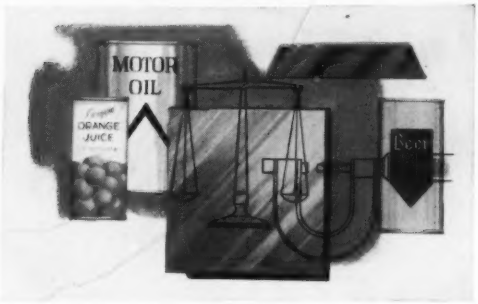
623

SW SINCE 1866 **SPROUT-WALDRON**
Muncy, Pennsylvania

Size Reduction • Size Classification • Mixing
Bulk Materials Handling • Pelleting

The Perfect Container doesn't Just Happen!

Ask any pelican if nature didn't provide him with the perfect container for doing what it is supposed to do . . . best. Chances are he'll reply, "Brother, you said a mouthful!"



New economies for can users.

In packaging, Canco containers of light-weight plate do what they are supposed to do . . . best!

The Steel Industry's recent perfection of double reduced plate first made these new light-weight containers possible. Canco Engineers spent months in intensive research adapting the new plate to containers meeting all of Canco's rigid specifications.

Widely used by frozen juice concentrate packers, brewers and oil refiners, these new containers could cut cost for the brewers and refiners alone by $10 million a year.

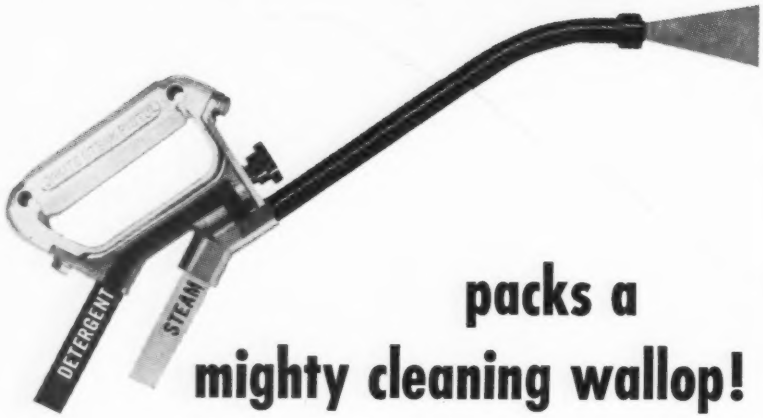
Test packaging of many other items in light-weight containers is now underway in our laboratories. A cost-reducing light-weight can may be the perfect container for your product. Get the details soon from your nearest Canco Sales Office.

GREAT CONTAINER IDEAS COME FROM CANCO

CANCO DIVISION

AMERICAN CAN COMPANY

The *NEW* Oakite Detergent Steam Pistol



packs a mighty cleaning wallop!

The amazing new Oakite detergent STEAM PISTOL places in the hands of one man a money-saving, fatigue-saving, heavy-duty cleaning tool that's hard to match for sheer handiness. Simply hose-up the 2½-pound PISTOL to your steam or air line and detergent tank. Turn the detergent knob and you're in business! Partial vacuum created within nozzle permits detergent solution to be sucked up into steam flow automatically. No gravity feed needed.

OUTSTANDING FEATURES: The PISTOL unites heat, impact and detergent action to give your maintenance men a devastating cleaning punch wherever dirt is particularly irksome or hard to reach. To insure the most efficient spray under varying conditions, knob on PISTOL allows fingertip control of detergent concentration and rinsing action. Good balance, "feel" and cool grippage are combined with rugged durability.

SEE FOR YOURSELF: Ask your Oakite man for an in-plant demonstration or send for Bulletin F-10933. Oakite Products, Inc., 26G Rector Street, New York 6, N. Y.

Technical Service Representatives in Principal Cities of U. S. and Canada

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OAKITE
SCIENCE
over 50 Est. 1909 years' leadership in industrial cleaning

← CIRCLE 111 ON INQUIRY CARD CIRCLE 112 ON INQUIRY CARD

Ingredients

which includes treating the brine with a trace of potassium ferrocyanide, converts the crystal form from the conventional cube to a branched, starlike shape.

Called Dendritic Salt, the free-flowing product has a lower density than regular salt, which provides increased surface area for rapid solubility and blending. Moreover, it doesn't segregate and can absorb considerable moisture before becoming caked.

Availability of this product to the food industry is contingent on FDA approval. The manufacturer has compiled the necessary toxicity data, which indicates that the product is harmless.

Supporting this view is the fact that the salt has been used in Europe for dry curing of bacon and hams, for repacking as domestic cooking salt, and in processing of butter, cheese, and gravy.—*Morton Salt Co., Chicago.*

Circle 467 On Inquiry Card

Apple Pectin, for processing of bakers' jams and jellies, promotes better heat stability during baking and decreases the amount of syneresis. Called "Ba-Jel," it spares bakers the inconvenience and loss of time that results from run-offs, also improves appearance of the finished product.—Speas Co., Kansas City, Mo.

Circle 468 On Inquiry Card

Imitation Blue Cheese Flavor is new concentrate with about 10 times the flavor strength of natural Bleu cheese. Available in paste or powder form, it imparts characteristic flavor to salad dressings, cheese dips, baked goods, popcorn, etc. — Marschall Dairy Laboratory, Inc., Madison, Wis.

Circle 469 On Inquiry Card

Food Acidulants—malic, succinic, and adipic acids—impart new and unusually pleasant tastes to frozen foods, packaged powder flavors, etc. Products are used either individually or as a blend.—Allied Chemical, National Aniline Div., New York City.

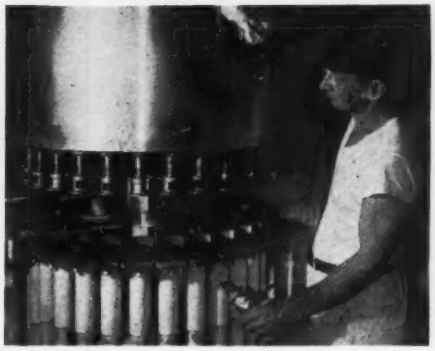
Circle 470 On Inquiry Card

Sodium Acid Pyrophosphate offers effective control of after-cooking darkening of potatoes.—Victor Chemical Works, Chicago.

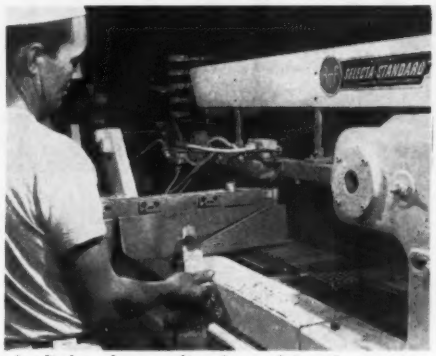
Circle 471 On Inquiry Card

SILICONE NEWS from Dow Corning

Sticking Gets The Slip



Applied to milk evaporators, preheater tubes and plug valves, SLIPICONE aids sanitation . . . facilitates removal of milk splatter . . . prevents trouble caused by sticking parts.



Applied to heat sealing bars of bread wrapping machine, SLIPICONE increases heat-transmission and film-sealing speed . . . prevents sticking and tearing, browning and ink smear.

SLIPICONE Keeps Equipment Clean For Peak Efficiency

Got a sticking problem? Solve it with SLIPICONE®, the Dow Corning *silicone release agent*. SLIPICONE puts a slick, stick-free surface wherever you want one . . . prevents adhesives, packaging materials and products from sticking to (or piling up on) any surface. Thus, SLIPICONE speeds operations, reduces waste, keeps packages clean . . . *saves money!*

Safe—Heat Stable. Nontoxic SLIPICONE is safe to use in contact with fresh, frozen or baked foods*. Temperature extremes have little or no effect on SLIPICONE . . . it stays on the job — prevents sticking — from 40° below zero to 400° F.

Easy does it! A thin coating of SLIPICONE is all it takes. Simply spray or wipe it on any surface as needed. Get SLIPICONE from your paper wholesaler or packaging materials supplier.

SLIPICONE comes in 2 oz. tube, 8 oz. tube, and 12 oz. aerosol . . . to wipe or spray sticking problems away!

* Write Dow Corning, Dept. 4719, for complete data on use of Slipicone in the food processing industry.

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The superiority of FRITZSCHE'S AROMALOK® FLAVORS
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the very finest flavoring ingredients made.

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While spray dried flavors are a trifle costlier
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they offer advantages in certain applications
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where flavor retention is a prime consideration.

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- CAKE MIXES
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PLANT ENGINEERING

MOTOR OVERLOAD PROTECTION. Describes features and advantages of small reliable device for units up to 50 amps locked rotor current. 2p.—General Electric, Schenectady, N. Y. **(211)**

STAINLESS STEEL. Details firm's facilities, services, and products with complete information on specs and available dimensions, shapes. 16p.—Eastern Stainless Steel, Baltimore, Md. **(212)**

PLASTIC PIPE. Gives size, pressure, and property information, including corrosion resistance comparison chart. 20p.—Kraloy Plastic Pipe Co., Los Angeles. **(213)**

PRESSURE REGULATORS. Contains features, operations, ranges, specs, and sizes of direct and reverse acting types. 12p.—Manning, Maxwell & Moore, Stratford, Conn. **(214)**

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SLEEVE BEARINGS. Introduces new types of self-allgning, self-lubricating units for use in temps up to 1000F. 6p.—Link-Belt Co., Chicago. **(216)**

TEFLON STOCK SHAPES. Lists available shapes and sizes, with permissible tolerances for all units. 8p.—Cadillac Plastic & Chemical Co., Detroit. **(217)**

PROCESS PUMPS. Describes new line of interchangeable units, detailing 72 basic combinations and choice of features. 8p.—Byron Jackson Pumps Inc., Los Angeles. **(218)**

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PROCESSING

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FEEDERS. Provides development, construction details, and features of new "Live Bin" unit for metering all dry materials. 4p.—Vibra Screw Feeders Inc., Clifton, N. J., **(227)**

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PACKAGING

SILICONE COATINGS. Shows how manufacturers, packagers, and users of sticky products save time and money with product's nonsticking or release characteristics applied to package liners. 6p.—Dow Corning Corp., Midland, Mich. **(239)**

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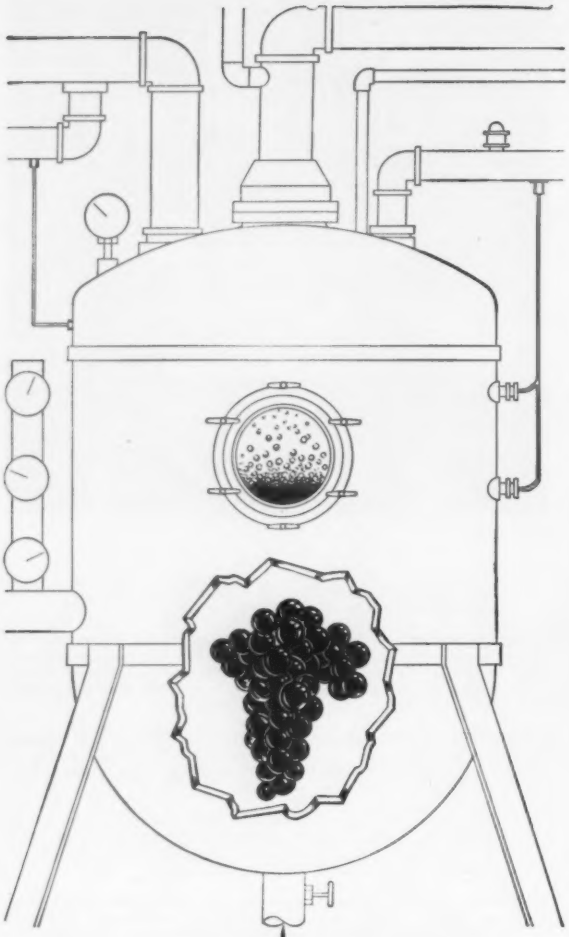

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MARKING METHODS, MACHINES. Details importance of legible, complete, and low-cost marking, identifying, or decorating of products, packages, and labels. 6p.—Markem Machine Co., Keene, N. H. **(246)**

FILM BAG LOADER, SEALER. Describes new unit that loads and seals plastic bags in one easy operation at speeds up to 40 bags/min. 4p.—Carbert Mfg. Co., Cambridge, Mass. **(247)**

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BRUSHES. Explains advantages of quality brushing tools and shows typical applications in variety of manufacturing processes. 20p.—M. W. Jenkins' Sons Inc., Cedar Grove, N. J. **(256)**

DUST SEPARATOR. Includes performance data, selection and dimension charts, and installation photos for new unit that handles fibrous, granular, abrasive, and fine or coarse dusts. 12p.—The Day Co., Minneapolis, Minn. **(257)**

SOAP SAVER. Explains how unique unit automatically measures and maintains solution strength in washing and cleaning equipment. 2p.—The Redford Corp., Scotia, N. Y. **(259)**

ELECTRONIC AIR CLEANER. Provides specs, illustrations, and cutaway diagrams of several models offering electrostatic method of removing dust and smoke from air. 15p.—American Air Filter Co., Louisville, Ky. **(260)**

INGREDIENTS

PROPYLENE GLYCOL. Provides technical data on chemical with hygroscopic and preservative properties for use as plasticizer and solvent.—Jefferson Chemical Co., Houston, Tex. **(261)**

STARCHES. Describes 19 different types for application in frozen and canned foods, bakery products, pail fillings, dry mixes, salad dressings, and confections. 2p.—National Starch & Chemical Corp. **(262)**

GRAPE JUICE CONCENTRATE. Handbook provides pertinent data, including uses, advantages, cost comparison, and technical information for preservers and bottlers. 20p.—Vie-Del Grape Products Co., Fresno, Calif. **(263)**

(Continued on page 118)

neptune

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Measurement/Control News

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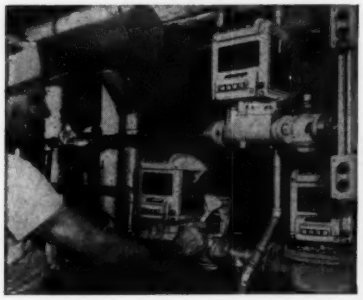
Three Liquid Meters Boost Table Syrup Production by 200%

The use of automatic shut-off meters at Nalley Syrup Co. now allows one man to produce three times the syrup formerly produced by five men handling bulk sugar and barreled corn syrup. The meters are



preset by pushbutton, taking less than 30 man-seconds to measure the sugar, syrup and water.

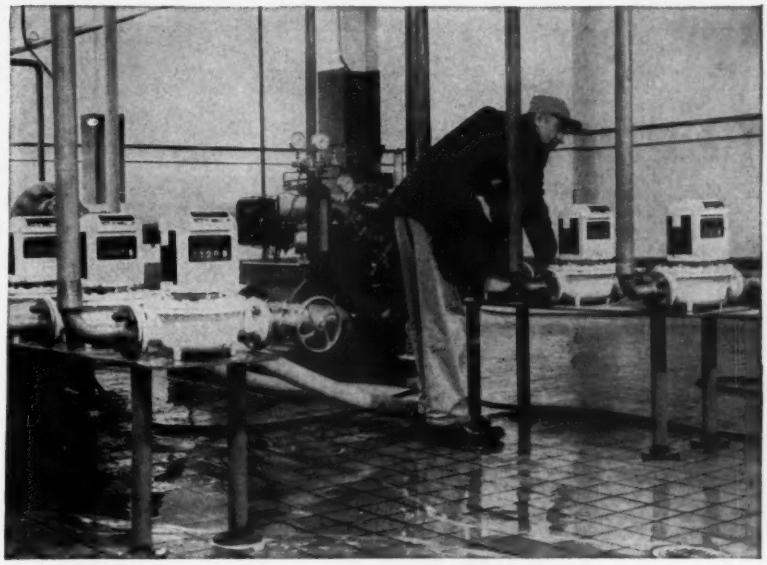
What works with these food ingredients can also work for you. Write today for helpful Bulletin 566RF, with selector charts listing over 150 different liquids now being metered.

Meter with a memory... Never forgets your formula

For liquid batching where formula repeats, this automatic meter has precise mechanical memory. Set quantity just once, open valve, and meter takes over. Shuts off at correct quantity batch after batch. Can even print tickets. Easy to reset for new formula. Ask for facts on Repeating Auto-Stop.

HOW TO STOP DRIP OF VISCOUS LIQUIDS. When metering viscous liquids, don't try to drain the line between meter and vat after each delivery. It'll drip forever, and you usually don't want air contact anyway. Instead, put an inexpensive spring-loaded Anti-Drip valve on the end of the pipe. Ask Neptune.

Carling's Improves Beer-makers' Art With Accurate Meters to Control Flavor



NATICK, MASS.—To make sure every drop of Carling's beer is formula-perfect, more than a dozen liquid meters accurately measure and record liquids used in various stages of the process at Carling's big Natick brewery. Principal uses are in finishing and blending, in filtration and carbonation rooms, and in wort processing.

Flow of many different liquids is registered automatically and continuously by Neptune meters, with big time-savings over batch-measuring methods previously used. According to Roger D. Williams, plant engineer, the meters are accurate and trustworthy, and are valuable for inventory control in addition to quality and uniformity control.

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28-pg. technical bulletin lists liquids, helps pick proper sizes and features of meters 2 to 2000 gpm.

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SURFACTANTS & EMULSIFIERS. Presents up-to-date catalog of specs and applications, including mono- and digiycerides and polyoxyethylene sorbitans of food-grade fats and oils with FDA approval. 27p.—Process Chemicals Co., Santa Fe Springs, Calif. **(264)**

MATERIALS HANDLING

PORTABLE CONVEYOR SECTIONS. Details nylon wheel and aluminum roller units, lightweight, easily portable, and quickly installed or interchanged. 4p.—Harry J. Ferguson Co., Jenkintown, Pa. **(266)**

BATTERY CHARGERS. Provides specs and illustrations of complete automatic unit line for motorized-hand and rider-type electric truck batteries. 4p.—Motor Generator Corp., Troy, O. **(267)**

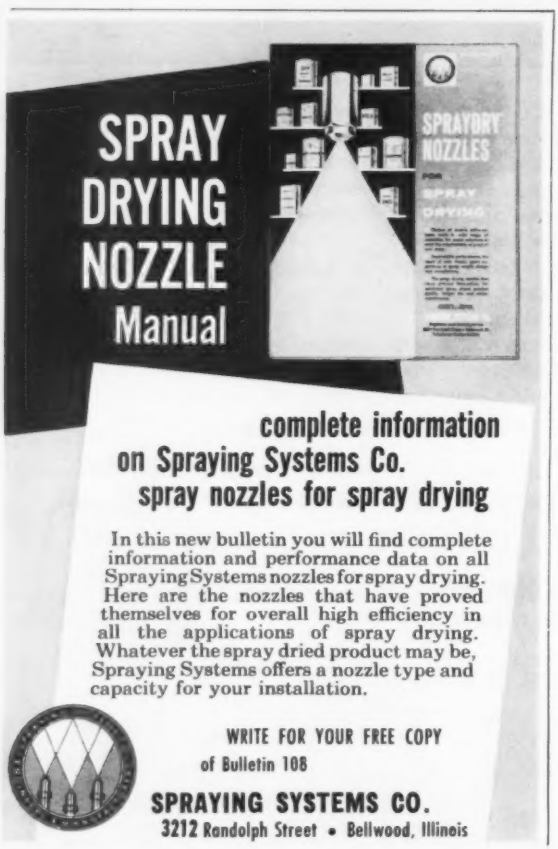
PNEUMATIC GRAIN HANDLING. Describes new portable transfer unit, employing high efficiency positive displacement blower. 4p.—Fuller Co., Catasauque, Pa. **(268)**

INDUSTRY SYSTEM ANALYSIS. Introduces new concept in handling of product items for maximum savings in labor handling costs. 6p.—Lewis-Shepard Products Inc., Watertown, Mass. **(269)**

MATERIALS HANDLING EFFICIENCY GUIDE. Exposes unwarranted handling expense and provides cost reduction through corrective measures. 25p.—The Yale & Towne Mfg. Co., Philadelphia. **(270)**

GAS-POWERED LIFT TRUCKS. Provides application photos of standard and special units with attachments pointing out how loads are handled in many industries. 16p.—Automatic Transportation Co., Chicago. **(271)**

HYPERBOLIC BIN OUTLET. Introduces new device that eliminates bridging, rat-holing, and erratic flow of granular or lumpy material. 4p.—The Bin-Dicator Co., Detroit. **(273)**



complete information
on Spraying Systems Co.
spray nozzles for spray drying

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INSTRUMENTS

PRESSURE & VACUUM GAGES. Describes firm's instruments for measuring, indicating, recording, and controlling pressures and vacuums involved in processing. 32p.—Minneapolis-Honeywell Regulator Co., Philadelphia. **(276)**

METERS. Illustrates construction and component parts of firm's industrial units ranging in size from ½" to 2", including specs and connection dimensions. 8p.—Rockwell Mfg. Co., Pittsburgh, Pa. **(277)**

ULTRAVIOLET SPECTROPHOTOMETER. Describes major features, outlines specs, and explains optical system and operating principles of double-beam instrument. 15p.—Beckman Instruments, Inc., Fullerton, Calif. **(278)**

LAB BALANCES. Details light-weight units designed for use in engineering and scientific laboratories, in research, and routine testing. 2p.—Soltest, Inc., Chicago. **(282)**

PHOTOELECTRIC TACHOMETER. Describes a completely portable unit for fast, accurate speed measurement of rotating and reciprocating machinery. 2p.—Simonds Worden White Co., Dayton, O. **(283)**

MAGNETIC COUNTER. Outlines advantages of high-speed unit for remote indication of equipment operation including list of typical applications. 4p.—Veeder-Root Inc., Hartford, Conn. **(284)**

MARKETING

PRODUCT MARKET. Report on dessert and pie filling markets discusses various product types available, packaging used, manufacturer's expenditures, brand preferences, and consumer usage. 44p.—Redbook Magazine, NYC. **(291)**

CONSUMER OPINION. Provides enlightening comments by housewives on brands, convenience foods, packaging, premiums, supermarket shopping, and other subjects. 70p.—McCall's Magazine, NYC. **(292)**

MARKET DATA. Gives fact-filled profile of coffee market, including data on regional consumption, per capita, and income levels. 20p.—Curtis Publishing Co., Philadelphia. **(293)**

NEGRO MARKET. Analyzes typical Negro urban households and how social processes influence brand decisions. 12p.—Johnson Publishing Co., Chicago. **(294)**

BRAND PROFILE. Details three-year trend in brand purchases among 65 food-beverage products in Omaha, Neb. and Council Bluffs, Ia., city trading zone. 108p.—World Publishing Co., Omaha Neb. **(295)**

MANAGEMENT

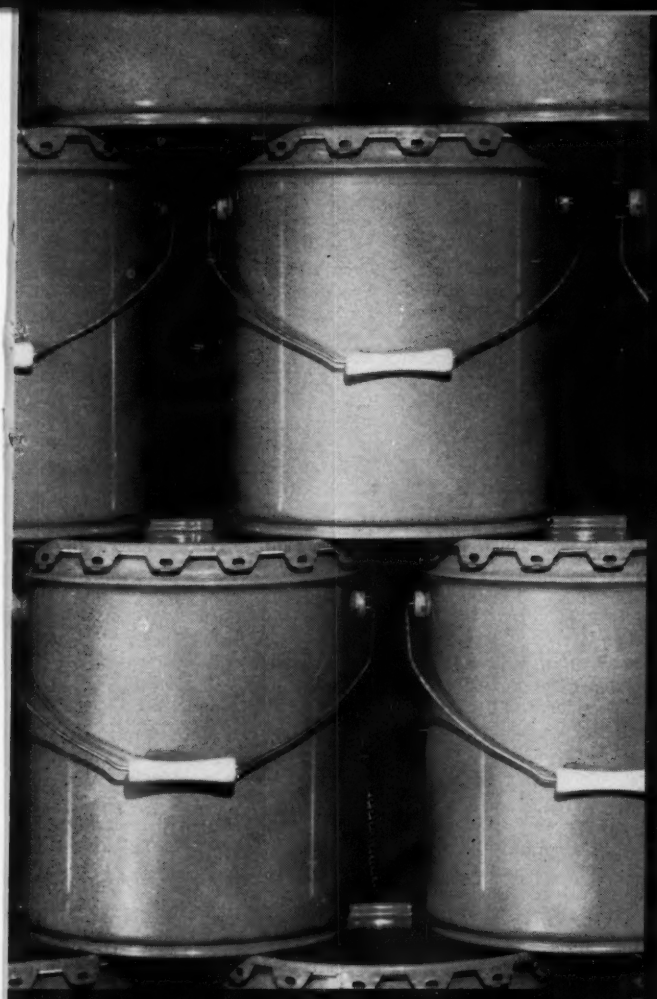
INDUSTRIAL UNIFORMS. Provides complete information on lint-free, acid resistant, synthetic fibre uniforms, their proper selection, usage, and care. 20p.—Fashion Seal Uniforms, Huntington, N. Y. **(301)**

MANAGEMENT CONSULTATION. New booklet, "Helping Business Help Itself," tells management consultant's story, tracing profession's early beginnings to present, including an examination of consulting firm's operating methods. 12p.—Profit Counselors Inc., NYC. **(302)**

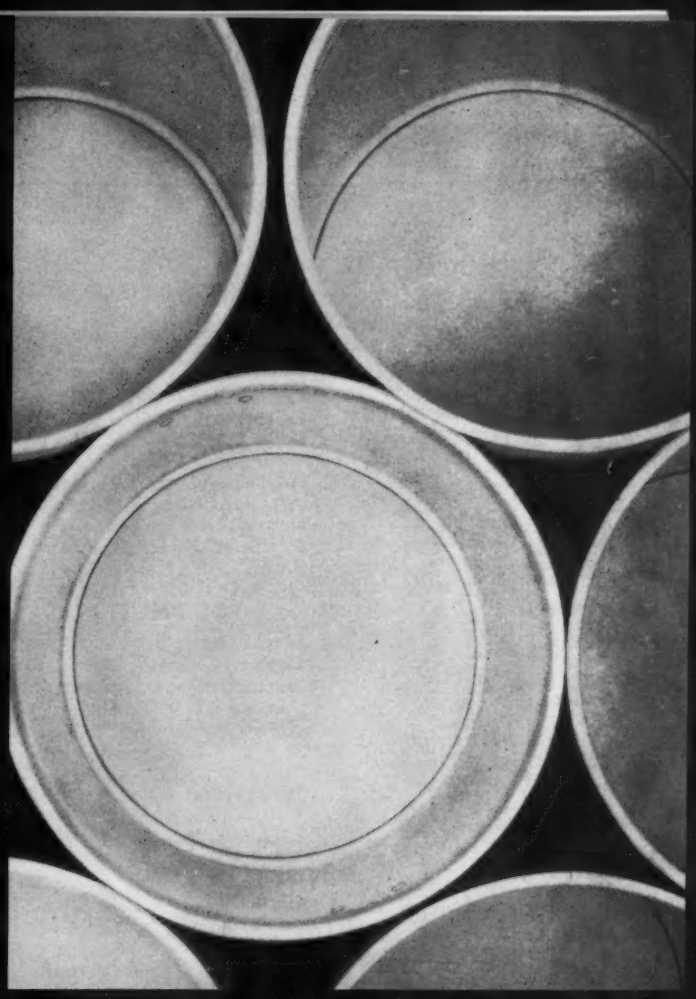
INDUSTRIAL CONTRACT RESEARCH. Describes balance of administrative controls between sponsor of a project and research institute engaged. 4p.—Battelle Memorial Institute, Columbus, O. **(303)**

NEW PRODUCT SURVIVAL. Details firm's diverse consumer product development services, including technology, flavor analysis, sensory panel studies, pilot consumer panel, and pilot plants. 4p.—Evans Research, NYC. **(304)**

RISKS OF CHANGE. Shows how you can cut down risks of change and in many cases strengthen your competitive position by understanding and planning for it. 4p. — Small Business Administration, Washington, D. C. **(305)**



ALL LINED PAILS LOOK THE SAME FROM THIS ANGLE



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No pinholes, no blisters, no skips, globs nor thin spots occur in lining applied by this exclusive method. Thickness is controlled to 1/10 mil tolerance over every inch of pail interior.

The Rheem Centrifugal Pail Lining process was developed especially for coating the interiors of cylinders. By using the highly efficient principle of centrifugal force instead of conventional spray gun techniques, it assures a new excellence in protection for products packed in pails.

Every pail lining variable is controlled: amount of lining applied, application angle, application speed. All are invariably uniform ... and so are the finished linings. The automatic Rheem process eliminates air turbulence, human error and reduces solvent content, too.

It's a process that assures the same product purity on delivery as at filling.

If you are now using pails lined by another process, or using packages of other basic materials, write for samples, information on linings or a testing program to 1701 West Edgar Road, Linden, N. J. Plants across the country.

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Flavor Enhancing and Stabilizing Composition for Creamed Cottage Cheese Comprising Citric Acid-Fermenting Organism in Citric Acid-Containing Milk Substrate. — F. J. Babel, Research Corp., N.Y.C. No. 2,971,847.

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Spongy Chewing Gum with Confection Embodied in Cavities of Spongy Mass. —G. C. Curtiss, Miami, Fla. No. 2,973,273.

Dry Cookie Mix in Block Form With Shortening Smeared on Flour and Chocolate Particles Sugar Coated.—J. S. Andrews, General Mills, Inc., Minneapolis. No. 2,975,059.

Cocoa-Butter Substitutes Containing Partly Hardened Palm Oil That's Fractionated. — S. Paul, Lever Brothers Co., N.Y.C. No. 2,975,063.

Fat-Containing Frozen Dessert Stabilized With Carboxymethyl Alginate. — G. D. Sperry, Kelco Co., San Diego, Calif. No. 2,975,064.

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EQUIPMENT

Liquid Controlled Vibration Producing Device for Vibrating Screens, Sieves and Tables.—V. G. B. Dupouy, Alger, France. No. 2,963,-914.

Bread Dough Rounder With Dusting Chamber. — C. W. Britcher, Glen Ridge, N. J. No. 2,963,994.

High Speed Roller Mills for Grinding Cereal Products.—J. S. Ball, Henry Simon Limited, Cheadle Hall, England. No. 2,969,193.

Closed Liquid Nitrogen Bath Chamber and Gas Lock Chamber With Communicating Elevator for Superchilling Frozen Food. — W. L. Morrison, Liquefreeze Co., Inc., N. Y. C. No. 2,969,649.

Fruit Transfer Unit Employed in Conjunction With Peach Pitter. — E. R. McClelland, Fliper Corp., San Pablo, Calif. No. 2,969,867.

Egg Handling System to Single-File Feed Eggs for Packing into Multicell Cartons.—R. B. Mulvany, Burlingame, Calif. No. 2,970,-418.

System for Automatic Proportioned Mixing and Grinding of a Batch Stock of Foods.—R. F. Skelton, Belle City Mfg. Co., Racine, Wis. No. 2,970,532.

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Machine With Cyclically Moving Dull Teeth for Compressing Ground Meat into Products with Appearance and Texture Resembling Steaks.—G. B. Gwilliam, Boise, Idaho. No. 2,971,216.

Milk-Treating Unit Featuring Deaerator for Supplying Product to Homogenizer.—E. K. Kinter, Sanitary Mfg. Co., Pittsburgh, Pa. No. 2,971,453.

PROCESSING

Molding Comminuted Meat Into Sausage Products Continuously.—O. A. Clemens, Swift & Co., Chicago. No. 2,965,491.

Manufacturing Dried Cheese Product of Predetermined Flavor.—H. E. Bauman, The Pillsbury Co., Minneapolis. No. 2,965,492.

Continuously Fermenting Yeast - Fermentable Substrate to Produce Potable Beverage. — K. H. Geiger, John Labott Ltd., London, Ontario, Canada. No. 2,967,-107.

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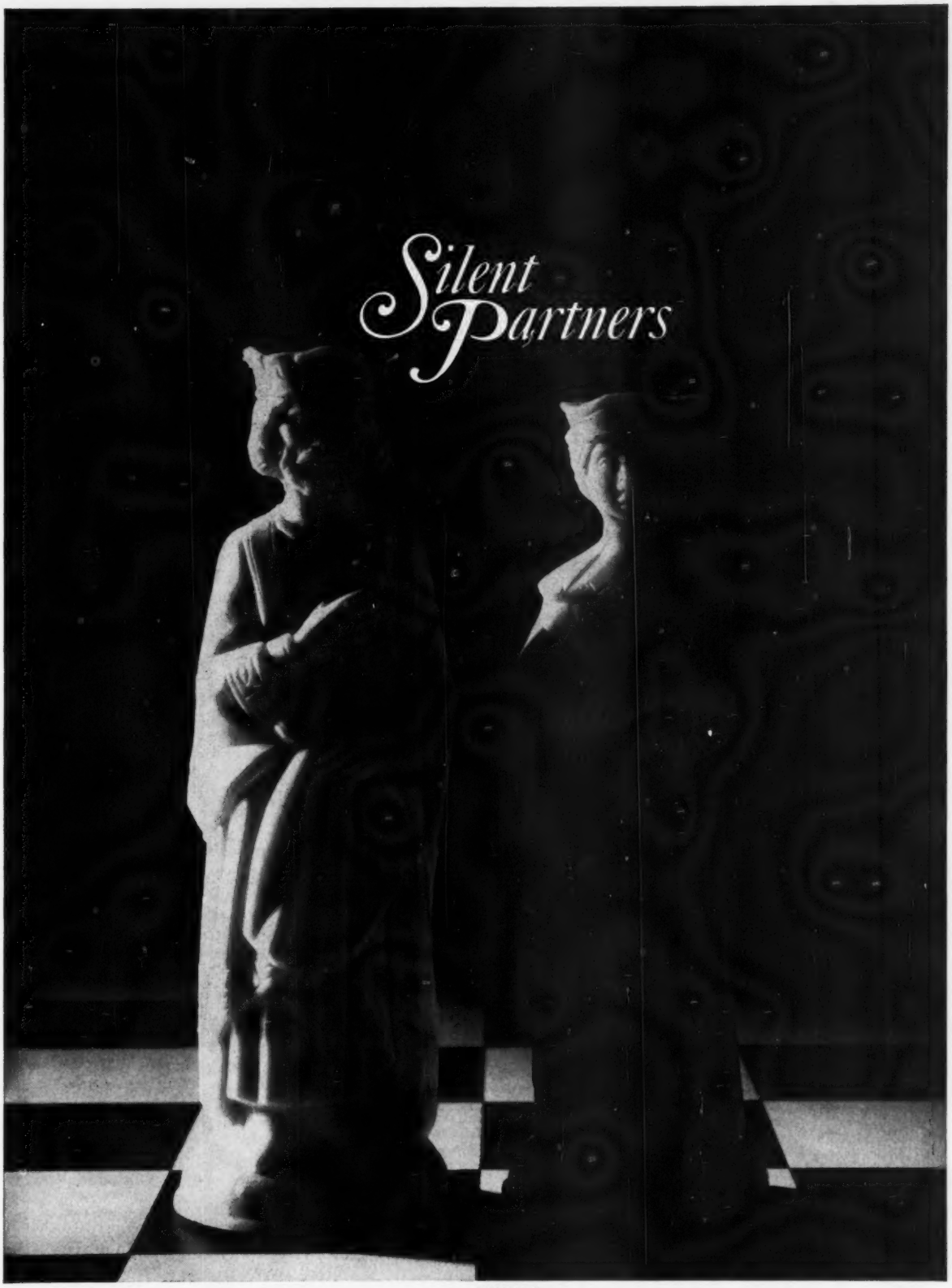

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REPORT OF THE 45TH NATIONAL CONFERENCE ON WEIGHTS AND MEASURES 1960. *Superintendent of Documents, U. S. Govt. Printing Office, Washington 25 D. C. 158p. Price: 75¢.* Records the full proceedings of conference, including texts of opening addresses.

APPRAISAL OF METHODS FOR ASSESSING THE SANITARY QUALITY OF MILK. *Information Div., Canada Dept. of Agriculture, Ottawa, Ontario. 1960. 34p.* Discusses in detail the methods of quality control used and their shortcomings, with suggestions for improvements.

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Like butter, carrot oil contains natural carotene—not synthetic. Used for vitaminizing food products where a yellow color is desired. No fishy odor or taste. Send for catalog and sample.

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Ingredients for The Food Processor

Wanted

WANTED

A MAYONNAISE FILLING MACHINE, stainless steel with sanitary fittings, to fill preferably on gallons or assorted sizes. Must be in good condition. Machine must be equipped with rising table to accommodate a bottom fill.

BOX FE-71
c/o FOOD ENGINEERING, Chestnut at 56th, Phila. 39

BRITISH MANUFACTURER
REQUIRES
PEANUT FRYING MACHINE
BATCH OR CONTINUOUS

BOX FE-85
c/o FOOD ENGINEERING, Chestnut at 56th, Phila. 39

FOOD Engineering Chestnut & 56th Sts., Philadelphia 39, Pa.

Please send me rates and general information about the Classified Section without obligation on my part.

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Company .....

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City ..... Zone ..... State .....

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Professional Services

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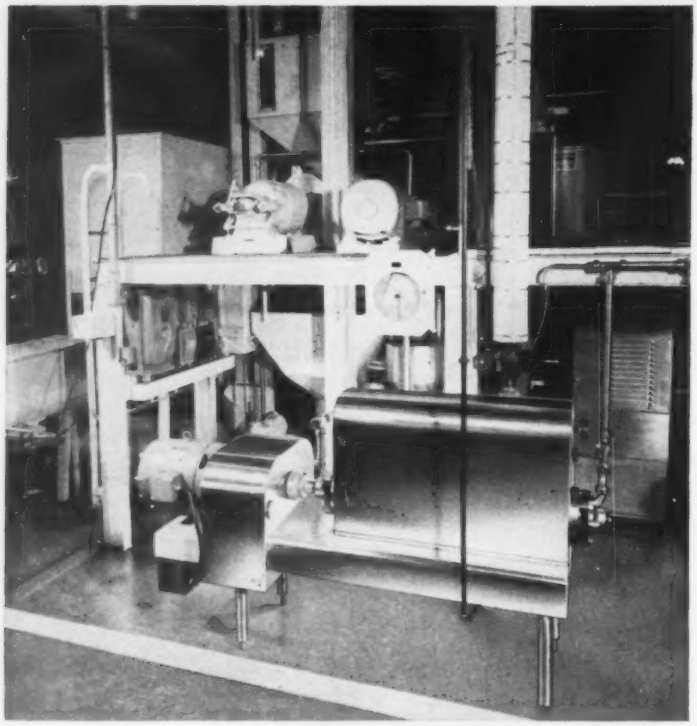


CP® EQUIPMENT processes... pumps... protects...

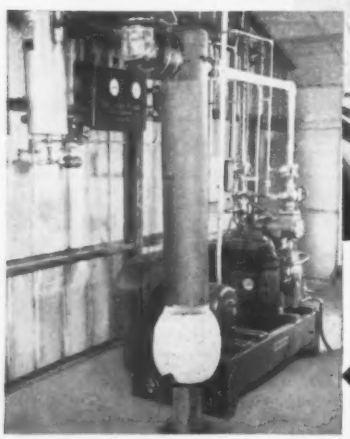
PEANUT BUTTER

at WM. BARNES, INC.
Minneapolis

Swept Surface CHILLER

Cold-pack processing of peanut butter at Wm. Barnes, Inc. centers around this compact CP Swept-Surface® Peanut Butter Chiller. Exclusive CP Dasher Blades continuously sweep peanut butter away from cooling surfaces to drop temperature from 180°F to 100°F at 2500-2800 lb./hr. CP Rotary Pumps move peanut butter to chiller.

Recognized quality of "Billy Boy" brand peanut butter is checked throughout processing cycle.



This space-saving CP type "K" four-cylinder 3½ x 3½ Ammonia Compressor does double duty, serves the Swept-Surface® Chiller and a frozen fruit storage room.

This compact, efficient processing facility co-ordinates a CP Swept-Surface® Chiller, CP Sanitary Stainless Rotary Pumps, and a CP Ammonia Compressor to meet exact processing needs.

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FOOD ENGINEERING

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Select . . . items that interest you as you read this issue. All items are conveniently named in two lists on the following three pages. First list is alphabetically arranged by name of manufacturer or supplier. Second is alphabetical by product or service category.

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Advertisers' Alphabetical Listing

Circle corresponding numbers at left on Inquiry Card

44 **A-B-C Packaging Machine.** Case Packer.
102 **American Bakers.** Show, information.
111 **American Can.** Containers.
91 **Avco.** Refrigeration Unit, information.
48 **Balcrank.** Reciprocating Transfer Pump, lit.
78 **Buffalo Meter.** Meters, Bul. 48.
26 **Chester-Jensen.** Cooker-Cooler.
18 **Clinton Corn Processing.** Flavors, tech. service.
128 **Creamery Package.** Pumps.
63 **Cummins Engine Co.** Diesels, brochure.
104 **Dorr Oliver.** Filtration Equipment.
32 **Dow Chemical.** Chelating Agent, information, samples.
54 **Dow Chemical.** Insulation.
113 **Dow Corning.** Silicone Release Agent, Complete data.
20 **Distillation Products.** Distilled acetylated monoglycerides.
108 **Electric Autolite.** Thermometer, information.
11 **Exact Weight Scale.** Checkweigher, Bul. 3377.
135 **Filpaco.** Stainless Steel Storage & Mixing Tanks, information.
116 **Flavorex.** Flavors, samples.
100 **Food Machinery & Chemical.** Fillers, Bul. P-811.
6 **Food Machinery & Chemical.** Continuous Pressure Cooker & Cooler.
5 **Fostoria.** Infrared Processing Equipment, folder.
70 **Foxboro.** Instruments, Data.
114 **Fritzsche Bros.** Flavors.
4 **B. F. Goodrich Industrial Products.** Conveyor Belts.
14 **Hoffman-La Roche.** Beta Carotene
134 **International Flavors & Fragrances.** Flavors.
69 **Jamison Cold Storage Door.** Cold Storage Doors, Bul.
94 **Johns-Manville.** Calcium Silicates, information, samples.
93 **King Co. of Owatonna.** Product Coolers.
75 **Klenzade Products.** Spray Cleaning, Lit.
122 **Kohlenberger Engineering.** Industrial Refrigeration.
121 **H. Kohnstamm.** Ingredients.
9 **Ladish.** Pump.
105 **LaPorte Mat & Mfg.** Conveyor Belts, Lit.
67 **Mack Trucks.** Trucks.
13 **Miles Chemical.** Citric Acid.
10 **Minneapolis-Honeywell.** Instruments.
73 **Mixing Equipment Co.** Mixers, Bul. B-526.
123 **Morton Salt.** Flavoring Tablets, information.
30 **National Starch & Chemical.** Stabilizers, Information.
117 **Neptune Meter.** Meters, Bul. 566RF, Specification Guide 566B.
133 **Norda.** Flavors.
112 **Oakite Products.** Detergent, Bul. F-10933.
19 **Owens-Illinois.** Containers.
84 **Pfaudler Permutit.** Heat Exchanger.
119 **Rheem Mfg.** Centrifugal Lining.
99 **Rid-A-Bird.** Bird Elimination Perch, Brochure.
27 **Riegel Paper.** Flexible Packaging.
17 **Robbins & Myers.** Food Pump, Bul. 100-FE.
58 **Sarco.** Temperature & Heat Control.
28 **Sharples.** Centrifuge.
22 **Southwestern Supply & Machine Works.** Countershaft Ends for Screw Conveyor Power Trans., Specs.
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109 **Sprout-Waldron.** Mixers, Bul. 148.
85 **Wm. J. Stange.** Seasonings.
2 **Sterwin Chemicals.** Ingredient.
23 **Sunkist Growers.** Exchange Low Methoxyl Pectin, Data.
98 **Surface Combustion.** Automatic Drying & Toasting Unit, Facts.
96 **Taylor Instruments.** Instruments, Cat. 500MP.
16 **Toledo Edison.** Plant Sites, Info.
52 **U. S. Stoneware.** Tubing, Bul. T-100.
49 **Urschel Laboratories.** Slicer.
80 **Viking Pump.** Pumps, Cat.

Product or Service Category Listing

Air Conditioning & Refrigeration

69 **Doors, cold storage.** Jamison Cold Storage Door.
209 **Refrigeration system.** H. H. McKinnies.

Cleaning & Sanitation

99 **Bird elimination perch.** Rid-A-Bird.
256 **Brushes.** M. W. Jenkins' Sons.
454 **Can rinsing.** Oakite Products.
251 **Cleaner, dry acid.** E. I. DuPont de Nemours.
112 **Detergent.** Oakite Products.
257 **Dust separator.** Day Company.
252 **Floor cleaner.** Multi-Clean Products.
456 **Pneumatic cleaning of dry mops.** U. S. Hoffman Machinery.
259 **Soap saver.** Redford Corp.
75 **Spray cleaning.** Klenzade Products.
254 **Steam cleaner.** Malsbary Mfg.

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JULY 1961

Expires Sept. 30, 1961

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A—Your Function

☐ 1. Corp. or Admin. Mgmt.
☐ 2. Plant Operat. Mgmt.
☐ 3. Tech. or Eng. Mgmt.
☐ 4. Other

B—Principal Product

☐ 1. Baked Goods
☐ 2. Beverages
☐ 3. Confectionery
☐ 4. Fruits & Vegetables
☐ 5. Grain Products
☐ 6. Meat, Poultry, Fish
☐ 7. Milk & Milk Products
☐ 8. Sugar & Sugar Products
☐ 9. All Other Foods

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Construction & Fabrication

255 Coating, floor. Garland Co.
455 Coatings, roof. Revere Chemical.
452 Epoxy floor resurfacer. Masury-Young.
54 Insulation. Dow Chemical.
453 Primer, damp-surface. Pennsalt Chemicals.
212 Stainless steel. Eastern Stainless Steel.
217 Teflon stock shapes. Cadillac Plastic & Chemical.

Disintegration Equipment

228 Jar mills. Abbe Engineering.
49 Slicer. Urschel Laboratories.

Electrical Equipment

211 Motor overload protection. General Electric.

Freezing Equipment & Supplies

93 Product coolers. King Co. of Owatonna.
91 Refrigeration unit. Avco.

Heat Transfer Equipment

84 Heat exchanger. Pfaudler Permutit.

Ingredients & Additives

14 Beta carotene. Hoffman-LaRoche.
94 Calcium silicates. Johns-Manville.
32 Chelating agent. Dow Chemical.
13 Citric acid. Miles Chemical.
469 Flavor, imitation blue cheese. Marschall Dairy Laboratory.
123 Flavoring tablets. Morton Salt.
18 Flavors. Clinton Corn Processing.
116 Flavors. Flavorex.
114 Flavors. Fritzsche Bros.
134 Flavors. International Flavors & Fragrances.
133 Flavors. Norda.
470 Food acidulants. Allied Chemical.
263 Grape juice concentrate. Vie-Del Grape Products.
121 Ingredients. H. Kohnstamm.
2 Ingredients. Sterwin Chemicals.
466 Monoglycerides. Distillation Products.
20 Monoglycerides, distilled acetylated. Distillation Products.
468 Pectin, apple. Speas.
23 Pectin, exchange low methoxyl. Sunkist Growers.
261 Propylene glycol. Jefferson Chemical.
467 Salt. Morton Salt.
85 Seasonings. Wm. J. Stange.
239 Silicone coatings. Dow Corning Corp.
113 Silicone release agent. Dow Corning.
471 Sodium acid pyrophosphate. Victor Chemical.
30 Stabilizers. National Starch & Chemical.
262 Starches. National Starch & Chemical.
264 Surfactants & emulsifiers. Process Chemicals.

Instruments, Measurement & Control

11 Checkweigher. Exact Weight Scale.
416 Chromatograph, gas. Beckman Instruments.
70 Instruments. Foxboro.
10 Instruments. Minneapolis-Honeywell.
96 Instruments. Taylor Instrument.
78 Meters. Buffalo Meter.
117 Meters. Neptune Meter.
277 Meters. Rockwell Manufacturing.
214 Pressure regulators. Manning, Maxwell & Moore.
276 Pressure & vacuum gages. Minneapolis-Honeywell.
409 Refractometer. Waters Associates.
278 Spectrophotometer, ultraviolet. Beckman Instruments.
415 Temperature sensors. Temptron.
58 Temperature & heat control. Sarco.
108 Thermometer. Electric Autolite.

Lubrication & Fuels

253 Fuel oil treatment. Nalco Chemical.

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295 Brand Profile. Omaha World-Herald.
292 Consumer Opinion. McCall's Magazine.
303 Controls for industrial research. Battelle Memorial Institute.
304 "Geared to new product survival." Evans Research & Development.
302 "Helping Business Help Itself." Profit Counselors.
293 Market data. Curtis Publishing.
294 Negro Market. Johnson Publishing.
291 Product Market. Redbook Magazine.
102 Show. American Bakers.
305 Bulletin. Small Business Administration.

Materials Handling

405 Activator, bin discharge. Vibra Screw Feeders.
208 Automatic egg handling. Food Machinery & Chemical.
413 Broad belt infeed unit. Island Equipment Corp.
4 Conveyor belts. B. F. Goodrich Industrial Products.
105 Conveyor belts. LaPorte Mat & Mfg.
22 Countershaft ends for screw conveyor power transmission. Southwestern Supply & Machine.
227 Feeders. Vibra Screw Feeders.
203 Fork truck. Link Belt.
271 Gas-powered lift trucks. Automatic Transportation.
273 Hyperbolic bin outlet. Bin-Dicator.
269 Industry system analysis. Lewis-Shepard Products.
270 Materials handling efficiency guide. Yale & Towne.
230 Molasses feeding. B-I-F Industries.
268 Pneumatic grain handling. Fuller.
266 Portable conveyor sections. Harry J. Ferguson.
216 Sleeve bearings. Link-Belt.
232 Vibrator feeders. National Air Vibrator.

JULY 1961

Expires Sept. 30, 1961

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IMPORTANT MUST INFORMATION

Please check in A & B below best description

WRITE—*name, title, company and address*

CIRCLE—*number of items you want*

MAIL

A—Your Function

- ☐ 1. Corp. or Admin. Mgmt.
- ☐ 2. Plant Operat. Mgmt.
- ☐ 3. Tech. or Eng. Mgmt.
- ☐ 4. Other

B—Principal Product

- ☐ 1. Baked Goods
- ☐ 2. Beverages
- ☐ 3. Confectionery
- ☐ 4. Fruits & Vegetables
- ☐ 5. Grain Products
- ☐ 6. Meat, Poultry, Fish
- ☐ 7. Milk & Milk Products
- ☐ 8. Sugar & Sugar Products
- ☐ 9. All Other Foods

Name ..... Title .....

Company .....

Address .....

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Where ads offer more than one item, I've written key number and identity below

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Mixing Equipment

407 Blender, liquid. Exactel Instrument.
231 Homogenizers. Creamery Package.
73 Mixers. Mixing Equipment.
109 Mixers. Sprout-Waldron.
80 Stainless steel storage & mixing tanks. Filpaco.

Packaging Equipment

44 Case packer. A-B-C Packaging Machine.
406 Caser. Mead Packaging.
100 Fillers. Food Machinery & Chemical.
247 Film bag loader, sealer. Carbert Manufacturing.
246 Marking methods, machines. Markem Machine.
412 Packaging unit. Bartelt Engineering.
402 Rayon strapping unit. American Viscose.
202 Sealer. General Corrugated Machinery.
403 Ultrasonic sealing of film. Ultra Sonic Seal.

Packaging Materials

311 Aerosol. Continental Enterprises.
317 Bottle pouring spout. Rieke Metal Products.
245 Cartoning system. Continental Can.
410 Clear label adhesive. National Starch & Chemical.
316 Container for prune juice. American Can.
111 Containers. American Can.
19 Containers. Owens-Illinois.
313 Foil box. United Board & Carton Corp.
212 Glass, commercial. Corning Glass Works.
318 Label paper. Nashua.
240 Packaging, creative. Creative Packaging.
241 Packaging developments. R-C Can.
27 Packaging, flexible. Riegel Paper.
314 Poly bag. Standard Packaging.
206 Polyethylene. Union Carbide Plastics Co.
411 Pressure-sensitive filament tape. Minnesota Mining & Mfg.
315 Reusable container. Kaiser Aluminum & Chemical.
312 Reusable plastic cover. Siax Industries of Mass.
244 Stretch-Pak. Dowingtown Paper.
207 Teflon coatings. Tri-Point Industries.
205 Shrouds, cloths of ramie. Bemis Bros. Bag.

Pipes, Valves, Tubing

118 Nozzle, spray drying. Spraying Systems.
213 Plastic pipe. Kraloy Plastic Pipe Co., Inc.
457 Plastic pressure pipe. Ceilcote.
401 Rubber hose, teflon lined. Pennsylvania Fluorocarbon.
52 Tubing. U. S. Stoneware.
219 Valves. American Chain & Cable.

Plant Services

408 Doors, rubber coated. Clark Door.
451 Storage cabinet. U. S. Hoffman Machinery.
301 Uniforms, industrial. Fashion Seal Uniforms.
220 Water service. Layne & Bowler.

Plant Site

16 Plant sites. Toledo Edison.

Power and Steam Generating Equipment

267 Battery chargers. Motor Generator.
63 Diesels. Cummins Engine.

Processing Equipment (Heat)

98 Automatic drying & toasting unit. Surface Combustion.
6 Continuous pressure cooker & cooler. Food Machinery & Chemical.
26 Cooker-cooler. Chester-Jensen.
5 Infrared processing equipment. Fostoria.
233 Processors. Cherry-Burrell.

Pumps

9 Pump. Ladish.
128 Pumps. Creamery Package.
135 Pumps. Viking Pump.
17 Pump, food. Robbins & Myers.
218 Pumps, process. Byron Jackson Pumps.
48 Pump, reciprocating transfer. Balcrank.
404 Pump, sanitary. Jabsco Pump.
414 Pump, sanitary. Randolph.
215 Pumps, sanitary. Jabsco Pump.

Separation Equipment (Wet)

28 Centrifuge. Sharples.
229 De-sludgers. Centrico.
104 Filtration equipment. Dorr Oliver.
226 Separators. Southwestern Engineering.

Shipping Containers

119 Centrifugal lining. Rheem.

Transportation

67 Trucks. Mack Trucks.

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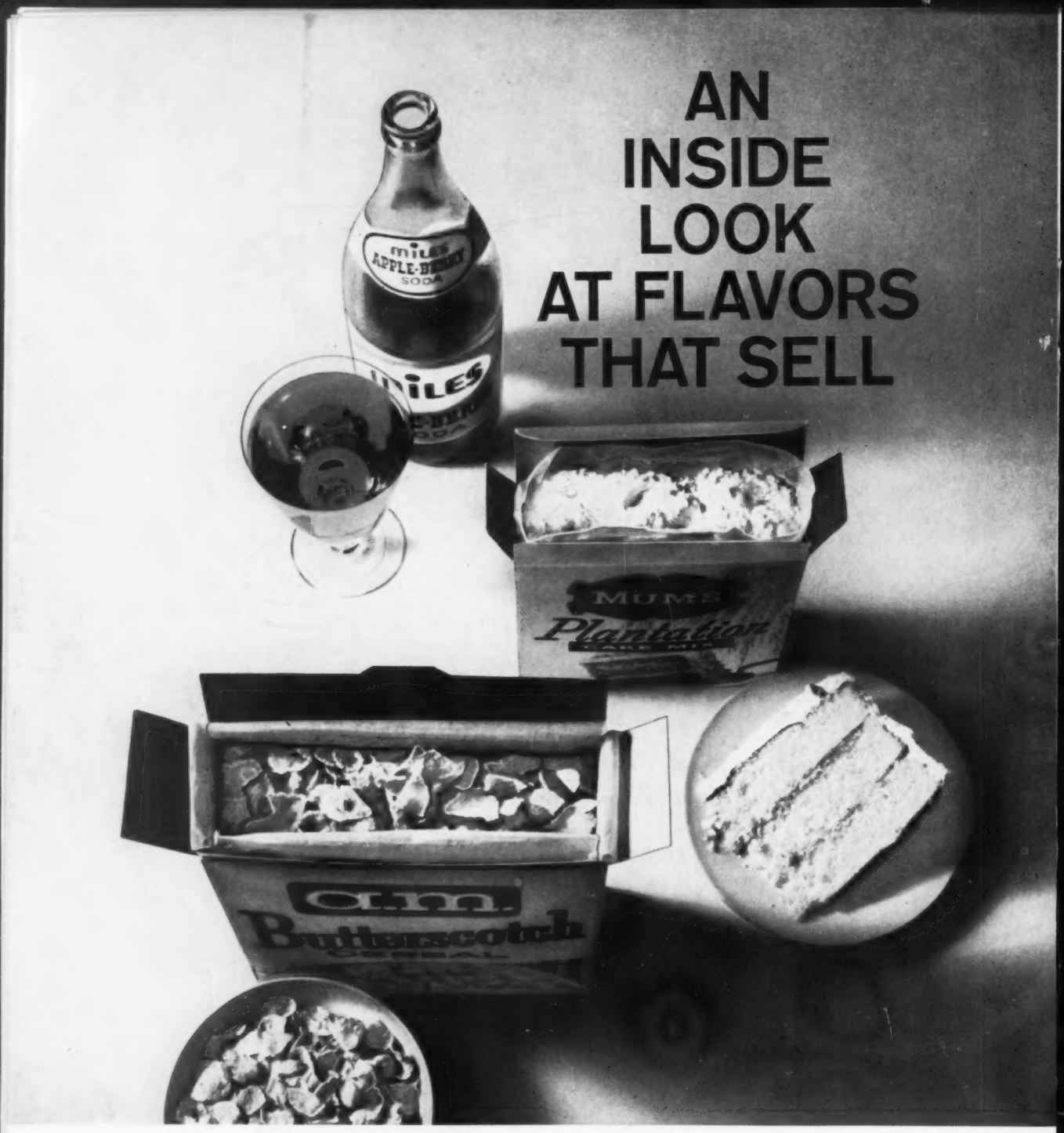

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